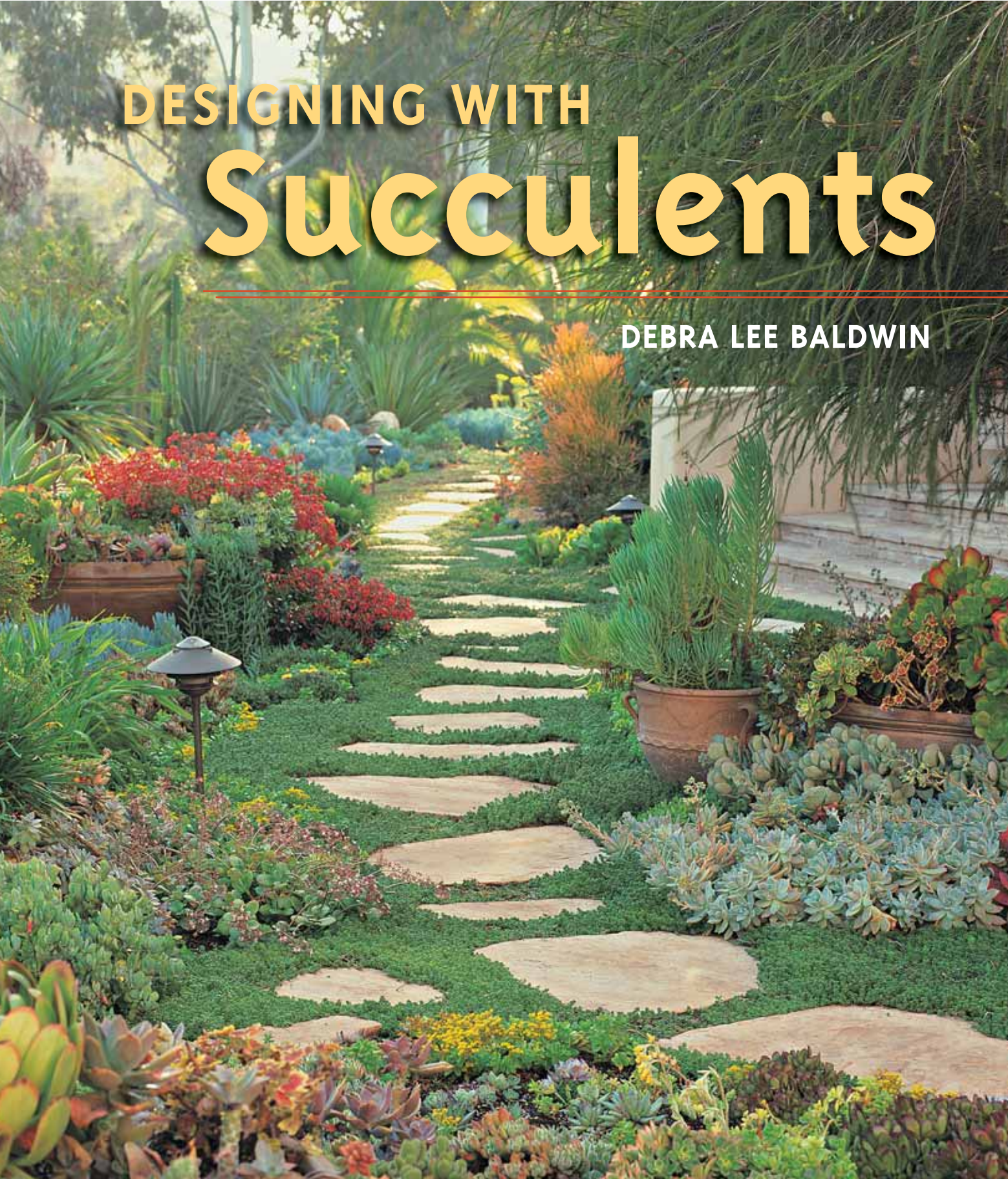


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DESIGNING WITH Succulents

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Designing with Succulents



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DESIGNING WITH Succulents



TIMBER PRESS

Frontispiece: Succulents of assorted sizes and textures combine to create a lush, drought-tolerant garden. In the foreground, yellow fruit ring the crowns of barrel cacti. Behind them are orange-flowered aloes and *Beaucarnea recurvata* trees.
Rancho Santa Fe, CA

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To Jeff, Art, and Sandra

Contents

ACKNOWLEDGMENTS	8
-----------------	---

PREFACE	9
---------	---

Diversity of Succulent Gardens ~ Book Overview ~ Plant Palette

Part One: Design and Cultivation

CHAPTER ONE : PLANNING AND DESIGNING YOUR GARDEN	19
--	----

Sun Considerations ~ Prepare and Repair ~ Evaluate the Soil ~ Water and Irrigation ~ Basics of Garden Design ~ Garden Enhancements ~ Front Yard Ideas ~ Pathway Plantings ~ Streetside Gardens ~ Slopes and Terraces

CHAPTER TWO : COLORFUL FOLIAGE AND FLOWERS	47
--	----

Succulents with Vivid, Colorful Leaves ~ Succulents with Gray, Gray-Blue, or Blue Leaves ~ Succulents with Brilliant Flowers ~ Using Color

CHAPTER THREE : THEMED AND SPECIALTY GARDENS	65
--	----

Landscaping for Fire Safety ~ Green Roof Gardens ~ Boulder and Rock Gardens ~ Succulent Tapestry Gardens ~ Art Gallery Gardens ~ Desert and Cactus Gardens ~ Beach Gardens ~ Sea-Themed Succulent Gardens ~ Geometric Plantings ~ Succulent Labyrinth Gardens

CHAPTER FOUR : POTS, WREATHS, AND CONTAINER GARDENS	93
---	----

Design Principles for Potted Arrangements ~ Style and Size ~ Pot Placement ~ Creative Design Ideas ~ Entry Pots ~ Plastic and Terracotta ~ Geometric Arrangements ~ Soil, Sun, and Fertilizer ~ Water and Drainage ~ Create a Succulent Wreath or Topiary

CHAPTER FIVE : GROWING SUCCULENTS IN COLDER CLIMATES	119
--	-----

Understanding Microclimates ~ Hard Frosts and Wet Weather ~ Coping with Occasional Frost ~ Indoor Cultivation ~ Cold-Climate Succulents

CHAPTER SIX : PLANT CARE AND PROPAGATION	133
--	-----

*In-ground Planting Tips ~ Weed Control ~ Grooming Your Plants
Hail and Snails ~ Harmful Insects ~ Propagation*

Part Two: Plant Palette

CHAPTER SEVEN : TALL, TREELIKE, AND IMMENSE SUCCULENTS	147
--	-----

CHAPTER EIGHT : MIDSIZED AND SHRUB SUCCULENTS	165
---	-----

CHAPTER NINE : SMALL, LOW-GROWING, AND GROUND COVER SUCCULENTS	185
---	-----

CHAPTER TEN : COMPANION PLANTS	209
--------------------------------	-----

*Annuals ~ Bulbs and Corms ~ Ground Covers ~ Herbaceous Perennials
Trees and Shrubs ~ Ornamental Grasses ~ Vining Plants*

RESOURCES	244
-----------	-----

BIBLIOGRAPHY	246
--------------	-----

INDEX	248
-------	-----

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Preface

Succulent describes any plant that survives drought by storing water in its leaves, stems, or roots. When I was a child, such smooth, plump plants reminded me of modeling clay, and their shapes of stars, beads, and jelly beans. As I grew older, I equated succulents with jade plants that thrive in abandoned gardens and were removed by people who were serious about landscaping.

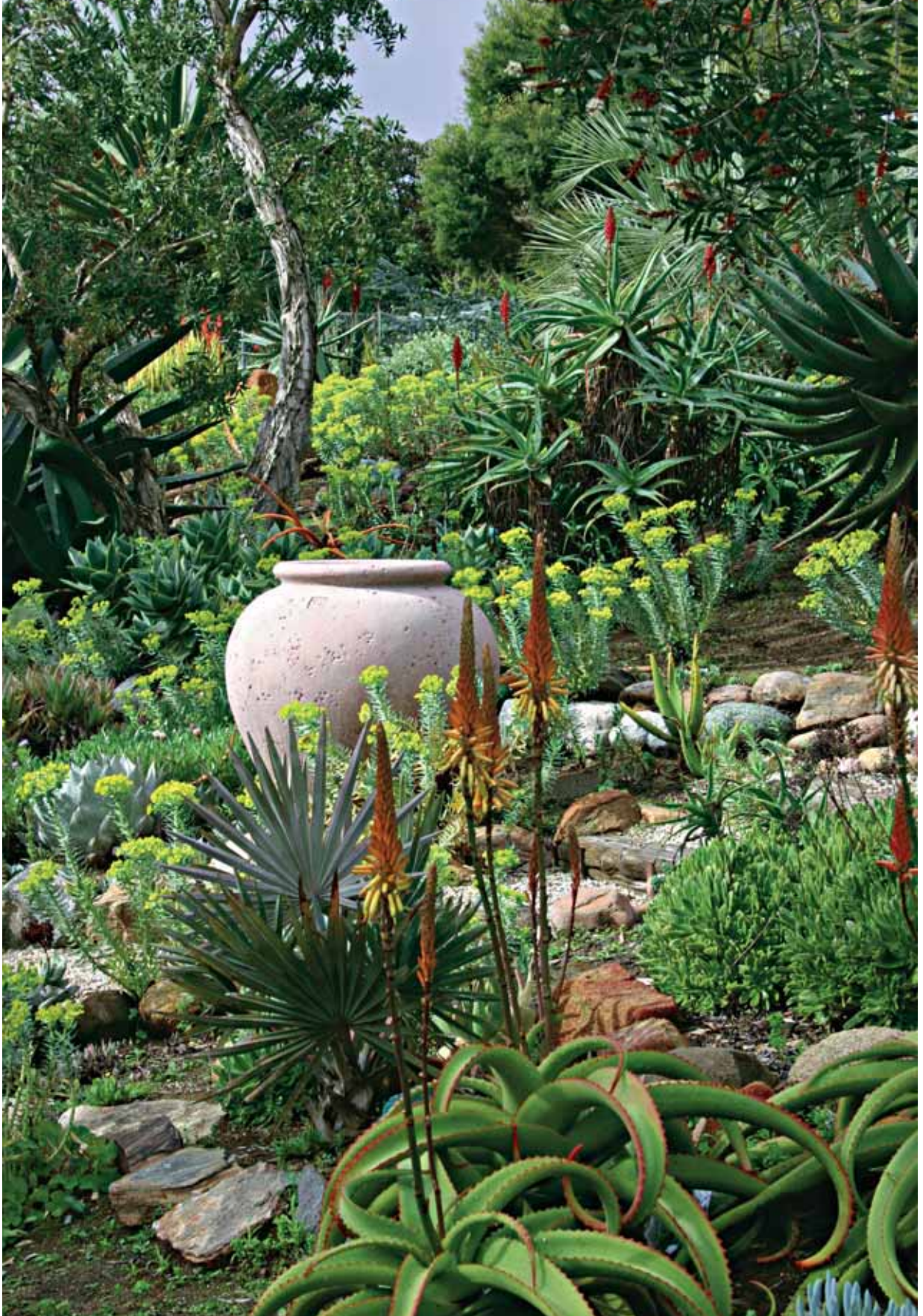
Succulents were far from my mind when I began gardening in 1990. Because I wanted big, bold, beautiful flowers, I cultivated tropical cannas, and my roses and fluffy perennials hearkened to English gardens—never mind that inland Southern California (USDA zone 9) is subject to frost, 100-degree heat, rain that falls minimally (and mostly in February), and the soil is decomposed granite, poor in organic matter. At one time I had more than a dozen varieties of cannas and 75 rosebushes, all of which required endless amending, mulching, fertilizing, pruning, spraying, irrigating, and deadheading. I still would be doing all that if my work had not introduced me to people who view gardening as an endeavor that ought to suit the region.

My job as a garden and design writer is to define and describe beauty. Whether I am touring a showcase house or a notable garden, I strive to find what makes the environment appealing. Architects, landscapers, and homeowners who design such settings dissect them for me, so my readers can learn their secrets.

In midwinter of 1999, when my garden consisted of pruned, leafless rosebushes; brown-leaved cannas; and perennials that had been cut to the ground, I was asked to write a story about Patrick Anderson's garden, located in Fallbrook, California, midway between Los Angeles and San Diego. That day in December his garden was lush and colorful, despite its decomposed granite soil and lack of automatic irrigation.

"Fleshy green monsters in Patrick Anderson's Fallbrook garden look like they might snap him up if he turns his back," my article began. "They're giant succulents, and Anderson's half-acre hillside showcases hundreds of unusual ones." The story went on to describe aloes that "pierce the sky like exotic torchbearers, hot orange against cool blue," and agaves that "sprawl like squids, or explode upward like fistfuls of knives."

I discovered that succulents are as elegant as they are dramatic and show to advantage in uncomplicated combinations. Two or three varieties carefully



selected for shape, color, and texture create simple, eye-catching compositions. Those succulents—notably agaves—with curved or undulating leaves suggest motion, which makes any garden more intriguing. Moreover, like seashells and snowflakes, succulent foliage forms patterns that illustrate nature’s innate geometry and that are striking when repeated.

During the next few years, I incorporated more and more succulents into my garden. Like traditional pruned hedges, succulents lent structure to the overall design but were much more practical. They held their shapes year-round and kept the same leaves for years. I learned firsthand that in a warm, dry climate, a garden comprising succulents and similarly drought-tolerant perennials makes sense economically, aesthetically, and ecologically. It is lush and appealing, requires significantly less water and maintenance than roses and tropics, and does not turn into naked sticks in winter.

Aeonium arboreum and *A. haworthii*, *Agave americana* ‘Marginata’, and *Bulbine frutescens* proved trouble-free—as did the aloes, sedums, senecios, kalanchoes, and graptopetalums that followed. These were readily propagated, and the results were so easy-care and appealing that my garden subsequently was featured in *Sunset* magazine and *Better Homes & Gardens*.

Since then, I have sought gardens throughout Southern California, and as far away as New York and Vancouver, that show succulents to advantage. This book is the result of my search; its purpose is to offer alternatives to traditional lawn-and-flowerbed landscapes and to show what is possible when succulents shine as primary garden elements. It is a guide to aesthetic and practical ways to cultivate, display, and enjoy these versatile plants, in the ground as well as in containers.

DIVERSITY OF SUCCULENT GARDENS

Gardens of succulents and plants with similar cultivation requirements fall into the category of *xeriscape*, which is the art of creating a water-efficient landscape. *Xeros*, from the Greek, means dry. What it does not mean is desert, nor is it a concept that is costly or difficult to implement. Moreover, not all xeriscapes look alike, as is evident by the diversity of the gardens shown in the photographs in this book. Succulents range from immense agaves to sedums with rice-sized leaves. They can grow alongside meandering pathways, in formal settings with geometric lines, on boulder-strewn hillsides, and in pots on patios and balconies.

A succulent garden is not the same as a cactus garden. While it is true that all cacti are succulents, not all succulents are cacti. Unlike other succulents, cacti



The tree-shaped *Aloe plicatilis* (at left), combines beautifully with bougainvillea and other Mediterranean plants. Rancho Santa Fe, CA. Container arrangements by Janet Sutro, Sequoia Environmental Enhancements

often have spines, actually modified leaves, that grow in clusters. Many prefer hot, dry growing conditions and do not fare well in soil that retains moisture or is rich in organic matter. Although gardens of this sort have appeal, this book's primary emphasis is on more user-friendly gardens. These feature succulents that are soft-leaved as opposed to prickly and that combine well with herbaceous plants from Mediterranean climates. This is not to say that cacti and succulents cannot complement each other, both in design and cultivation; indeed, many landscapes featured in these pages combine the two. But rather than looking barren, these gardens are lush and abundant.

The more than 50 genera of succulents and cacti mentioned in this book are by no means all that exist or that are available, but rather those best suited to residential landscapes. It is a blessing of the 21st century—and one we take for granted—that we can include such plants in our gardens. Kalanchoes from Madagascar, for example, were unknown in the United States in 1950. And some of the showiest succulents, such as the fancy ruffled echeverias, are hybrids introduced during the final few decades of the 20th century.



Cacti and succulents intermingle on an Escondido, California, hillside that encompasses several acres of steep, rocky terrain. At foreground left is *Agave attenuata*; at right, yellow *Bulbine frutescens* in bloom. Orange flowers are *Aloe striata*. Spiky-leaved trees framing the composition are *Yucca aloifolia*, and in the background are purple spires of *Echium candicans* (pride of Madeira). Cacti include *Cereus peruvianus*, *Opuntia ficus-indica*, and *Stenocereus*. Design by owner Peter Bailey

Most—but not all—of the succulents included here come from areas of the world that are hot and dry and that receive minimal rainfall. These plants are best suited to USDA zones 9 and 10, although they will survive outdoors in zones 8 and 11 with adequate protection from frost, excessive heat, and moisture. This ideal climate is found sporadically in latitudes from 20 to 40 degrees, notably marine-influenced, nontropical areas of the U.S. South and Southwest, Mexico, Pakistan, northern India, eastern China, Taiwan, southern Japan, South America, South Africa, Australia, New Zealand, and the Mediterranean. In other zones, especially during seasonal temperature extremes, succulents are best cultivated indoors.

Horticulturist and landscape designer Thomas Hobbs, who lives and gardens in Vancouver, British Columbia, brings his succulents inside every winter—a task he considers well worthwhile. In his book, *The Jewel Box Garden* (2004), Hobbs

writes, “Succulents are to today’s hippest gardeners what *Canna* and *Colocasia* were five years ago. They are at the epicenter of a new botanical quake of creativity. Their ease of culture and fabulous variety of form allow anyone to create something fairly amazing their very first try.”

BOOK OVERVIEW

This book’s initial chapters provide suggestions for planning and preparing your garden, including tips on soil amendment and irrigation. You will discover the basic principles of landscape design—scale, proportion, repetition, contrast, emphasis, and texture—and learn how to apply these in your garden. As you conceptualize your ideal landscape, you will consider various enhancements, such as water features, dry streambeds, pathway borders, streetside plantings, and terraces. You will learn how to transform your front yard into a welcoming, low-maintenance entry garden. And, because succulents come in every hue, including blue, red, purple, orange, and black, an entire chapter is devoted to color.

One intriguing way to design with succulents is to create a garden that resembles a coral reef. You will discover how this is done in chapter 3, which includes other gardens that meet a need or illustrate various themes. Here you will find succulents for desert, beach, fire-safe, boulder, and art-gallery gardens; geometric and tapestry plantings; green roofs; and a labyrinth.

In any climate or region, succulents can be grown in pots. Those shown in chapter 4 are lovelier—and much longer lasting—than any floral bouquet and will thrive in the same environment you enjoy yourself: your home’s sunny indoor areas. This chapter also ventures into the art of topiary; succulents grow readily in moss-filled forms that are by no means limited to wreaths.

If you live where frost and wet weather are concerns, you will find chapter 5 especially helpful. It offers over-wintering advice and lists succulents that thrive in zones 8 and below and features gardens in Oregon, Washington, upstate New York, North Carolina, and Pennsylvania.

Although few pests bother succulents, you will learn how to control those that do in chapter 6. This chapter also includes propagation instructions that will help you start new plants from existing ones.

PLANT PALETTE

Before selecting any succulent for your garden, know its size at maturity. Size has practical as well as aesthetic implications. Many aloes and agaves, for example, become huge, which can be either a benefit or a drawback. In the wrong spot, such grand plants outwear their welcome and can be tricky—even treacherous—to relocate.

To help you with plant selection, Part Two includes four chapters that make up the Plant Palette: tall, tree-like, and immense succulents; mid-sized and shrub succulents; small, low-growing, and ground cover succulents; and companion plants. To make this book most useful for garden design, I have categorized succulents according to their aesthetic and practical uses. Therefore, euphorbias, aloes, agaves, and others appear in more than one chapter, based on their size at maturity and growth habits. Plant names used are those recommended by the Royal Horticultural Society, the *Sunset Western Garden Book*, and other recognized horticultural authorities.

Aesthetically pleasing landscapes tend to include plants from all palette categories, although this is not a hard-and-fast rule. Regardless of the size of your garden—even if it is a collection of containers—think high, medium, and low: one or more large plants for drama and height, mid-sized shrubs for lushness, and ground cover as filler.

As you evaluate succulents and companion plants and choose those that appeal to you, note how much cold they will tolerate, their sun and water requirements, and how much and what kind of care they will need. Directional references throughout the book (such as “north-facing” and “south side”) apply to the northern hemisphere; readers south of the equator should adjust the information accordingly. Also, references to “the Southwest” refer to the Southwestern United States.

Browse the Plant Palette for a general idea of what is available, and then refer to it in depth as you refine your garden’s design. Numerous trees, ground covers, bulbs, annuals, and perennials that share growth and cultivation requirements with succulents can be used as companion plants to add variety. Finally, resources in the back of the book provide names of public gardens that specialize in succulents or show them in landscape applications.

You will discover that succulents provide an ideal medium for garden designers and homeowners who also are artists. Few other plants are so sculptural and make such statements in the landscape. With this book as your guide, your garden will become an open-air gallery of three-dimensional, ever-changing art.



Agave americana 'Mediopicta Alba' and blue senecio complement the color of the orange *Euphorbia tirucalli* 'Sticks on Fire'. The agave's crisp symmetry also contrasts with the soft, loose look of the senecio and euphorbia. Carolyn and Herbert Schaer garden, San Diego, CA. Design by Michael Buckner



Part One

Design and Cultivation



Chapter One

Planning and Designing Your Garden

A curved pathway with asymmetrical pavers winds through a side yard, flanked by drifts of ground cover succulents in a variety of colors. Bright red *Kalanchoe uniflora* blooms add punch. Rob and Suzy Schaefer garden, Rancho Santa Fe, CA. Design by Robert Dean. Photo by Lisa Romerein



Agave attenuata. Design by owner Amelia Lima, San Diego

Professional landscape designers keep certain considerations in mind as they evaluate a site. When you understand these fundamentals, beautiful gardens will no longer seem mysterious and unattainable. You will view your own garden afresh and be better able to implement—and communicate—what you hope to achieve.

This chapter explains how basic design principles apply to yards, pathways, slopes, and more, and it shows the aesthetic applications of a wide variety of succulents. As you prepare your garden's canvas, continually envision the placement of plants that appeal to you. You will soon recognize those that are especially useful and begin to realize how they might enhance your landscape. Soft-leaved *Agave attenuata*, for example, is among the most appealing and versatile of plants—and a key component of many of the gardens shown in this book.

SUN CONSIDERATIONS

Throughout the year, the sun rises and sets at gradually earlier or later times and at slightly different spots on the horizon. These seasonal changes affect the quantity of light, heat, and shade that your house, outdoor living spaces, and garden receive. In general,

slopes that drop to the north or northeast get less heat than those that fall to the south or southwest. Landscape architects often place swimming pools on the west side of homes because people use their pools in the afternoon and want to enjoy the sunset while relaxing in the spa or dining outdoors.

In addition to helping to determine areas of outdoor activity, sunlight factors into optimal growing conditions for plants. In southern latitudes, for example, heat-sensitive aeoniums and echeverias need full sun in winter and semishade in summer. In high-elevation or desert gardens, where the sun is harsh, they will need some shade. In lower elevations in northern latitudes, those same plants will do fine in full summer sun.

Plants in any region tend to grow in the direction of greatest sun exposure. Rosette and fountain-shaped succulents do this noticeably, and their placement in the garden should be made with this in mind. In my sloping, east-facing garden, for example, a large *Agave americana* 'Marginata' grows just east of a pathway but does not encroach, because it leans toward the morning sun. Orient new plants—especially large ones—in the direction they would grow in nature, or their placement will appear contrived.

The elements also impact a garden's aesthetics. Sunlight cast on spiny plants makes them glow and creates intriguing shadows. Silhouettes and the sky are part of a landscape, as is the wind, which creates motion. Feathery ornamental grasses and narrow-leaved succulents, such as *Yucca whipplei* and dasylirions, are living mobiles; they shimmer when backlit and ripple in the breeze. And any garden benefits from the addition of water—even if only suggested by a dry streambed.

PREPARE AND REPAIR

During your garden's planning stages, sketch its layout on graph paper. Begin by drawing anything that will not change, such as your house, property boundaries, walls, and fences. Make several copies of the basic sketch, and then use them to conceptualize different garden plans. One plan might have straight pathways aligned on a central axis, perhaps with a fountain in the middle; another might have paths that flow around a pond or peninsula-shaped beds. Keep in mind views, microclimates, and practical considerations such as utilities and tool storage. Sketch walkways that lead to and connect outdoor areas for sitting, sunning, dining, and other activities tailored to your family's needs and recreational interests. Next, plan the layout of each garden room, defining where various elements—such as large rocks, decking, outdoor furnishings, and container groupings—will go. Represent trees as circles that approximate their size at maturity, and use colored pencils to block in massed plantings.

Shaggy trees can be transformed with proper trimming. Once established, a tree cannot be moved—or removed—without expense and inconvenience, so before you plant one, find out how large it will grow, how much leaf litter it will shed, and whether it is prone to disease. Depending on where a tree is positioned, it can shade a sunny window or sitting area; cut glare from water, reflective buildings, or pavement; and deflect (or redirect) wind. If you want shade in summer and sun in winter, plant deciduous trees.

Many excellent books explain how to build berms, terraces, and retaining walls and install pathways, irrigation systems, and outdoor lighting. One comprehensive guide for homeowners is *Complete Home Landscaping*, by Catriona Tudor Erler (2000). If your concept is especially complex, design software programs can help. For any task beyond your expertise, such as installing a



Potted cacti (notably *Myrtillocactus geometrizans*) make a highly textural, low-maintenance arrangement that tolerates heat and sun.

pergola, deck, patio, pool, or other water feature—or tackling drainage and other grading concerns—hire a professional. Most landscape professionals charge an hourly fee and can provide an estimate on an entire project, from initial plans to installation. If you see a garden you like, ask the property owner who helped create and/or install it. Also check with horticultural societies, garden clubs, the local Cactus and Succulent Society of America (CSSA) chapter, and nurseries that specialize in dry-climate plants. Organizations such as the American Association of Landscape Architects (ASLA) and, in California, the California Landscape Contractors Association (CLCA) can provide names of members in your area. Request to see past projects—not just photos, but actual gardens you can visit. Rapport is important; make sure the landscaper shares your aesthetic, welcomes your input, has worked with succulents, and understands their cultivation requirements.

EVALUATE THE SOIL

Unlike roses and tropicals, succulents do not require a growing medium so rich in organic matter it resembles chocolate cake. But should your garden be blessed with such soil, succulents likely will thrive if it provides the drainage they require.

Determine your soil type by digging a hole the size of a 1-gallon nursery pot. Then fill the hole with water. If it drains rapidly, in a few minutes or less, your soil is probably sandy, which will benefit from the addition of organic matter. If the water takes an hour or more to drain, the soil likely is clay and inhospitable to succulents—indeed, to most garden plants—and you will need to amend the soil, build raised beds, or make planting berms that contain a good growing medium.

Public gardens that cultivate succulents formulate their amendments based on deficiencies in the native soil. At the Santa Barbara Botanic Garden, for example, heavy clay soil is amended with compost, gravel, sharp sand, and wood chips—a mix designed more to enhance texture than nutrient content. (Sharp sand, unlike fine, silty sand, has coarse grains that feel sharp when rubbed between the fingertips.) At the Huntington Botanical Gardens in San Marino, California, forest compost is added to the soil, plus pumice if drainage needs improvement, prior to planting. At the Arizona-Sonora Desert Museum in Tucson, which showcases cacti, heavy soil is top-dressed with 6 to 12 inches of well-draining soil mixed with enough sulfur to keep the pH between 6.5 and 8.

Obviously, since soil varies from region to region, and even within areas of a garden, amendment formulas vary. The only definitive method to find out which additives—such as agricultural lime and compost—will turn your soil into the perfect growing medium is to have it analyzed. This also will determine its alkalinity (a pH between 6 and 7 is best for succulents). For more information on soil analysis, check with local agricultural advisories.



When a dehydrated *Crassula pubescens* is watered, its shriveled leaves become plump again.

WATER AND IRRIGATION

If you are planning a landscape of primarily desert-adapted plants and larger agaves and aloes, you may not need to irrigate your garden if rainfall is adequate. The plants should be fine with infrequent watering with a hose and detachable sprinklers. But just because cacti and succulents can survive without irrigation does not mean they do not appreciate it. A little extra water can make the difference between a parched landscape and a green and lush garden.

When succulents are actively growing, they do best when watered well once or twice a week. As they enter dormancy, they need less water—on average, every two to three weeks. The majority of succulents are winter-dormant, but a few slow down in summer. In this book, if a particular plant will suffer when watered during its dormancy, that fact is noted in the Plant Palette.

Most succulents can handle more water than they need, providing their roots are in coarse, fast-draining soil. Although this means you can mix them with ornamentals that have greater water requirements, the best companions for succulents need a minimal amount once established. To take advantage of natural drainage, position succulents on the tops and sides of berms and banks, so they are higher than their thirstier neighbors. Perennials and annuals that need more water should go at the base of such a planting, where runoff is greatest.

If you live in a hot, dry climate, you will find an in-ground, automatic irrigation system a great convenience. Automatic systems (which also can be used manually) can be programmed according to zone, so that a lawn receives more water than, say, a bank of ice plants. Minimize water waste with micro-sprayers,

bubblers, low-angle nozzles, and drip irrigation. Drip puts water where a plant needs it most and cuts down on weed growth from overspray. Drip emitters dribble steadily and can be retrofitted into conventional systems. Use screw-on adapters to extend drip tubing from the nearest riser to the base of a plant.

Impact sprinklers and fixed or pop-up spray heads are the most popular irrigation products for watering lawns, slopes, and densely planted areas. Spray heads provide options in terms of how much area they cover (full circle, half circle, quarter circle, or a horizontal strip) and the volume of water they project. Because spray heads can be easily changed, you can mix or switch them to serve greater or lesser areas.

After your irrigation system is installed, test it seasonally to evaluate its efficiency.

BASICS OF GARDEN DESIGN

As you delve into the six main elements of design, you will gain clarity on how to create an aesthetically pleasing landscape that perfectly meets your needs. Elements detailed here are scale and proportion, repetition, contrast, emphasis, and texture. The last element, color, is so useful in maximizing the design potential of succulents, the entire next chapter is devoted to it.

SCALE AND PROPORTION

Scale and proportion concern the size of plants and structures in the landscape as they relate to one another and to the whole. A landscape with properly proportioned elements feels inviting and is a good fit for its human inhabitants. For example, a large tree that dwarfs a small house would look more proportional alongside a multistory building. A 3-foot pond that suits a small yard would be practically invisible in a large park. Correct scale and proportion can be as simple as placing small plants in small spaces and large plants in large spaces. It is more effective to fill a blank wall or corner with a single dasyliirion—or a large ornamental pot—instead of a jumble of geraniums.

Intimate areas lend themselves to frilly echeverias and jewel-like sedums; large areas, to majestic agaves, yuccas, aloes, and companion plants such as phormiums. If your back yard feels open and unprotected, the right-sized plants can transform it into a sheltered open-air room. Conversely, an area of your yard that feels claustrophobic likely will benefit from removing clutter and pruning to open up trees and shrubs.



REPETITION

The foliage of a plant is often more important in garden design than its brief floral display. Perhaps more than any other plants, succulents—because their leaf shapes are distinctly pointed, oval, or cylindrical—offer opportunities for crisply defined repetitions of form. Designers refer to these harmonious, recurring patterns as a garden’s *rhythms*. They have the same soothing effect as a musical motif; in fact, when I see such repetitions in a well-designed garden, I hear music.

Repetition can be a difficult principle for plant collectors who want one of everything and see no point in having extras. But repetition is essential for unifying a landscape. Large agaves, in particular, illustrate this: Just three of them, all the same and strategically placed, will lend continuity to a garden, regardless of its other components. And if those agaves are variegated, so much the better; their striped leaves will provide another motif.

Repetition is not always multiples of the same plant, though. It can be achieved in subtler ways, by creating patterns and using silhouettes. A yucca planted near an agave shares the same spiky shape, as do tufts of blue fescue at its base. Color, too, is an effective way of playing the same tune with multiple instruments. Combine *Senecio serpens*, *Agave parryi*, *Crassula arborescens*, and *Festuca glauca*, and you have four-part harmony sung in silvery blue.

Phormiums, aloe trees, euphorbias, and cacti are in proportion to this house and to each other. Rob and Suzy Schaefer garden. Design by Robert Dean



Spiky leaves on a slender *Dracaena marginata* repeat the outline of an *Agave tequilana*, while the blue of the agave echoes the color of the home's window frame. Stephen Hill garden, San Diego. Design by Southwest Landscape



Coral tree (*Erythrina x sykesii*) flowers repeat the orange of *Aloe ferox* spires. In the background is yellow-blooming *A. marlothii*. Design by owner Patrick Anderson





Drifts of blue senecio match the trim color of this home, as do the leaves of *Aloe ferox* (foreground, with orange-red flower spikes). At upper left is an *Aloe barberae* tree; on the right, *Alluaudia procera*. Janice Byrne garden, Del Mar, CA. Design by Bill Teague



A peach-colored wall repeats the sunset hue of *Euphorbia tirucalli* 'Sticks on Fire', which in turn contrasts with the gray-blue ornamental grass and *Cotyledon orbiculata* (lower right). Threadlike grass stems are echoed by the larger baseball-bat branches of the tall euphorbia and again by the chopstick limbs of 'Sticks on Fire'. Shapes contrast: The euphorbia in the background is tall and slender, 'Sticks on Fire' is mid-sized and shrubby, and *Festuca glauca* forms a low mass of up-thrusting points. Design by owner Suzy Schaefer

Rounded, orange-red *Kalanchoe luciae* foliage repeats the tiles' terracotta color and cloverleaf patterns. Note the effective use of complementary colors (blue and orange). Gloria and Ramon Ross garden, La Mesa, CA. Design by owners



Aeonium arboreum 'Zwartkop', shown here in full bloom, contrasts with the home's pale hues and white trim.



Wispy Mexican feather grass (*Nassella tenuissima*) provides a delightful texture contrast to agaves. Unlike more thirsty ornamental grasses, its cultivation requirements are similar to those of succulents. Don and Jill Young garden, San Diego. Design by owners and Bill Schnetz, Schnetz Landscape, Inc.

CONTRAST

Repetition is soothing, contrast is exciting, and a well-designed garden has both. Repetition works up to a point and then becomes tedious; this is when contrast comes into play. For example, in a multiple planting of agaves and yuccas, the addition of soft, airy ornamental grasses is refreshing. Or you might add a plant that contrasts with the agaves' blue-gray color, such as red or coral-colored *Kalanchoe blossfeldiana* or bright red *Crassula coccinea* 'Campfire'.

Asymmetry is another form of contrast and can be used effectively to lend interest to a monotonous landscape. Although symmetry—such as urns planted with aeoniums flanking an entryway, or a driveway bordered on both sides with aloes—can be pleasing because of repetition, few plants in nature form

perfect pairs or grow in straight lines. Asymmetry, like curves, is more natural. Anything aligned, straight, or right-angled suggests human intervention.

EMPHASIS

Emphasis refers to any item strategically placed to attract attention, such as a tree, statue, or fountain used as a focal point. These draw people toward garden areas and create destinations. Obvious locales to emphasize are the center of a circle or the end of an allée. Less obvious are a bend in a curving pathway or a gap in a hedge. Hardscape creates sight lines that lead the eye to what lies beyond.

If you live on a slope overlooking a golf course, city skyline, distant mountains, the ocean, or a verdant canyon, position sitting and entertaining areas accordingly and frame the view with large and majestic agaves or cereus. Also, consider your home's windows as picture frames and create outdoor garden vignettes you can enjoy from indoors.

Another useful landscaping concept, the *axis*, is a visual line that extends between two emphasized elements, such as a walkway that connects two sitting areas. In formal gardens, plants typically are aligned on either side of an axis, and focal points are placed where two axes intersect.

Because sight lines can also emphasize undesirable objects, evaluate your landscape for unattractive items you have seen so often, you no longer see them. One way to gain fresh perspective on your garden is to turn your back on it and look at its reflection in a hand mirror. When I did that in my own yard, I noticed a yellow "Yield" sign on the busy street beyond. Before I saw it reflected in the mirror, I had been oblivious to the sign.

When you identify an eyesore, take measures to make it less obvious. Either position something intriguing in the same line of sight, so the viewer's eye stops there, or camouflage the offending object with shrubs or a structure, such as a lattice screen. If the problem is a telephone pole, a vertical plant will hide it or draw the eye away from it. Should you want to veil neighboring second-story windows, add lacy trees that have similar cultivation requirements as succulents but that are much faster growing—such as *Melaleuca* and *Acacia*. Multiple plantings of yuccas, *Euphorbia tirucalli*, large aloes, and agaves can also serve as living walls, screens, and hedges.



Hardscape emphasizes a garden gate, and low walls double as benches. On the right, statuesque *Aloe marlothii* is perfectly in scale with its surroundings. In the foreground, crimson *Kalanchoe blossfeldiana* borders a cluster of *Euphorbia resinifera*. The wall's buttery color enhances the composition, and reds repeat throughout.



A fountain surrounded by agaves graces the intersection of main pathways in this section of the Huntington Botanical Gardens. Red spires, in the background at left, are *Hesperaloe* blooms. Drifts of blue senecio contrast with pink-leaved echeverias to form a multicolored, textural ground cover. Orange-flowered dyckias are beautiful but treacherous plants; their leaves are like serrated knives. Design by Joe Clements

Magazine stylists, prior to a photo shoot, routinely remove or disguise anything in a garden that strikes a discordant note and calls unwanted attention to itself. Typically, these include garden hoses, plastic pots, dirty or faded patio umbrellas, and anything leaning at an odd angle (such as bamboo torches). As I prepared my own garden to be photographed, I made utility boxes disappear by painting them the same color as the stucco wall behind them; hid a hose in a wooden barrel (I threaded the hose through a knothole in the bottom); spray-painted white irrigation risers brown or replaced them (they come in black and gray); and painted a tool shed the same tan color as my garden's soil.

TEXTURE

Texture is integral to other elements of design and refers to the way light hits surfaces. Texture is both visual and tactile. Use it to enhance contrast and repetition



Three dasylirions with pin-cushion silhouettes contrast beautifully with the soft cloud of feathery green foliage on a Mexican palo verde (*Parkinsonia aculeata*). *Euphorbia cooperi*, at left, adds a thicker texture. Christopher and Jodi Queen garden, San Diego

and to call attention to focal points. Keep it in mind as you select and position plants that have fuzzy, waxy, shiny, or dull leaves. Other textural aspects of a garden include tree bark, hardscape, and the overall shapes and forms of shrubs—which can change depending on whether they are viewed up close or from a distance.

Textural effect is relative to the surroundings. Even gravel, which at first appears coarse, can look soft when placed alongside boulders. Designers like to mix textures to create striking contrasts, but a little goes a long way. The addition of plants with mid-sized leaves can serve as an effective bridge.

Spiky *Yucca rostrata* shows to advantage against a smooth tan wall and contrasts with a cluster of *Echeveria imbricata* at its base and a mound of *Senecio talinoides* alongside the gate. Spires of red *Kalanchoe luciae* repeat the shape and colors of *Aloe buhrii* in flower (foreground). Strappy leaved daylilies will bloom bright yellow in summer. Paul Huntzinger garden, San Diego.

Design by Ecosystems Imagery





A pond, fountain, and potted cycad grace the entry garden of a Rancho Santa Fe estate. Pavers laid on the diagonal make the space seem larger. *Aloe plicatilis* in the foreground adds color and texture.



The soothing sound of a waterfall enhances Thomas Hobbs's Vancouver garden. The water feature's stone walls shelter a collection of echeverias and green-and-white-leaved *Sedum spectabile* 'Frosty Morn'. Design by owner Thomas Hobbs. Photo by Allan Mandell

GARDEN ENHANCEMENTS

As you conceptualize your landscape, consider incorporating a water feature, a structure, or a similar enhancement that makes your garden an inviting extension of your home.

WATER FEATURES

Splashing water blankets intrusive sounds and muffles conversations, so even your closest neighbors cannot overhear. It also mirrors the sky, creates a habitat for fish, and serves as a focal point. Options include birdbaths, free-standing fountains, in-ground ponds, and recirculating streams.

STRUCTURES AND HARDSCAPES

An arbor lends height and vertical interest and can support a flowering vine, such as hoya, or an edible one, such as grapes. Such structures also might shelter a bench or a table and chairs.

Pathways lead visitors to various garden destinations and serve as roadways for anything with wheels—from tricycles to wheelbarrows. Pavement options include bricks, randomly placed flagstones, stepping stones, gravel, and poured concrete.

When positioned outside a sliding glass door, a patio or deck provides an easily accessible dining and sitting area. Situated in the garden—perhaps alongside a pool or barbecue grill—patios and decks define outdoor rooms.

Planters and raised beds lend themselves to herb and vegetable gardens and can show off cascading succulents, such as graptopetalums and burro tail (*Sedum morganianum*).

If you have small children, set aside areas for a lawn, sandbox, and/or swing set. Bright-colored plastic jungle gyms and playhouses can be eyesores, so do not position them prominently—a side yard is ideal.

To transform a patio or garden room into an inviting area at night, install a fire pit or outdoor fireplace.

Use river rocks and gravel that channel rainwater to suggest an *arroyo* (dry creek bed) and provide a natural-looking access area for maintenance.

Accessories for a garden room with an outdoor fireplace include cushions and tiles that mirror the bright red of *Euphorbia milii* blooms, at far left. On the right is *E. ingens*. Design by owner Karen Phillips, Elfin Forest, CA





When selecting stones to line a dry creek bed, choose those that appear to have been worn smooth by water.

FRONT YARD IDEAS

Traditional front yard landscapes tend to be bland and high-maintenance, with turf that needs mowing, fertilizing, and de-thatching. Lawns are often bordered by shrubs that need pruning and beds planted with annuals. One or more trees drop leaves that require raking. No green component will survive without regular and ample water.

Envision, instead, a meandering pathway of brick or stone that connects the sidewalk to your front door. Flanking it are mounds of decomposed granite dotted with boulders and planted with aeoniums, agaves, echeverias, and tree aloes. Ice plants and ornamental grasses provide contrasting colors and textures.

In general, a garden of succulents and drought-tolerant ornamentals needs one- to two-thirds less water than the same area of lawn. A lawn requires more water per square foot than anything else you might grow in the same space. It is an ideal play surface for children, but for most activities, 500 to 800 square feet is plenty.

A reduced-size lawn will be more visually appealing if it flows in graceful curves rather than being square or rectangular. You might flank an oval lawn



Tufts of blue fescue (*Festuca glauca*) offer textural contrast to coral aloes (*Aloe striata*) that brighten this front yard. Hardscape leads indirectly to the home's entry, which is positioned asymmetrically on the right and is emphasized by an ornamental archway, a large pot, and a cluster of blue agaves. Design by owners Diane and Mark Hampton, San Diego



This succulent garden replaced a front lawn. A burgundy-leaved *Euphorbia cotinifolia* makes a striking backdrop for tall *E. ammak* 'Variegata'. The treelike succulent between the windows is *Kalanchoe beharensis*. In the foreground on the left is *Agave desmettiana* 'Variegata'. Design and photo by Michael Buckner

with a drosanthemum that blooms vivid pink or red in spring and that surrounds several dramatic variegated agaves.

Moreover, a lawn, because it needs mowing, has to be level (or nearly so). When you replace it, you have the option of creating highs and lows that suggest hills and valleys. Mounded soil is more visually interesting, adds instant height to young trees, and discourages people from cutting across newly planted areas.

San Diego garden, soon after installation. Photo by Michael Buckner



The same garden four years later. The strip of lawn was a requirement of the homeowners' association. Carolyn and Herbert Schaer garden. Design by Michael Buckner



The front garden of this San Diego home combines aloes, aeoniums, and senecios with existing mature trees, including a large podocarpus. The steps continue into a flagstone-paved area between street and sidewalk, which makes the garden seem larger and provides space for people exiting parked cars. Shoshanah and Geoff Sternlieb garden. Designed by owners, Aino Sten, and Michael Buckner

Pathways between mounds might lead to tucked-away sitting areas as well as your home's entry.

Michael Buckner, owner of The Plant Man nursery in San Diego, specializes in converting turf-and-flower-bed yards to succulent landscapes. He says it takes only three years for a newly planted succulent garden to fill in; by five years, it looks so good that people assume it has been there twenty. Buckner begins designing front yards by considering the location of the street and mailbox, where people open their car doors, and where they park. In his landscapes, the front yard is wide and inviting. He adds boulders, believing they lend a sense of mystery and beckon the viewer to explore beyond. He brings in soil that is amended with pumice, so it drains well, and then positions mounds of soil and boulders according to the highs and lows of the home. If a house has a gable on the left, for example, he places the largest boulder on the opposite side for balance. The biggest rock is placed first, as in a painting. Large and upright succulents come next, and then smaller ones. He also plants in drifts, because in nature, plants grow naturally where water distributes itself over the landscape.





(left) Pleasing repetitions of color and form in this front garden include a clay tile roof, terracotta sun, flagstone steps, and *Aloe arborescens* flowers—all in shades of coral. Those same elements repeat curves in the ironwork of the garden gate. Christopher and Jodi Queen garden

(opposite) Queen palms give this garden a tropical ambience. Multiple *Agave attenuata* rosettes and drifts of blue *Senecio serpens* contrast in texture and color with a variegated ornamental grass (right). The grass in turn repeats the shape of the palm fronds and visually ties the upper and lower parts of the composition. The agaves are in scale with the setting, and a collection of smaller, colorful succulents are situated where they will be noticed—along the stairs. David and Phoebe Sackett garden, La Jolla, CA. Design by Jeff Moore

(below) A gently sloping bank showcases a lavish succulent garden. Adding height in the background are *Aloe thraskii* (in bloom) and *A. 'Hercules'* (*A. barberae* × *A. dichotoma*). Midsize succulents include *A. cameronii* (crimson flowers) and *A. vanbalenii* (yellow-orange flowers). Their bright colors are echoed by orange *Euphorbia tirucalli* 'Sticks on Fire' and the rusty hues of the rocks. Golden barrel cacti (*Echinocactus grusonii*) provide texture and color contrast. Ground covers include blue *Senecio serpens* and mounding *Portulacaria afra* 'Variegata'. Design by Jeff Moore, Solana Succulents nursery, Solana Beach, CA







An S-shaped pathway of irregularly shaped flagstones bisects this front yard. Tree succulents include tall *Euphorbia ingens* on the right and *Aloe dichotoma* at left. Arthur Salm and Susan Duerksen garden, San Diego. Design by owners and Michael Buckner



Ivy geraniums cascade over a stone terrace alongside a gravel path. *Agave attenuata* appears at the upper right and purple-blooming, drought-tolerant mallow and statice (sea lavender) are at upper left. Design by owner Peggy Petitmermet, Elfin Forest, CA



Senecio mandraliscae flanks a pathway of Saltillo pavers.

PATHWAY PLANTINGS

Pathways through a succulent garden provide a means for people to enjoy aeoniums, aloes, echeverias, and more up close. For a simple, eye-catching juxtaposition of complementary colors, flank orange-hued pavers with blue senecio.

STREETSIDE GARDENS

When landscaping a streetside garden, consider the scale of the area to be filled and provide hardscape if the area will have foot traffic. To create a simple but harmonious composition, repeat plant material and arrange ground covers in swaths. If you install large agaves and aloes, make sure they have plenty of room to grow, so they will not need trimming.



Tall *Euphorbia ingens*, a mix of vivid-flowering ice plants, and *Aloe striata* hybrids with branching flowers lend a cheerful, welcoming ambience to a dry garden bordering an entry drive. Design by owner Bobbi Hirschkoff, Encinitas, CA



Sometimes the simplest composition is the most effective. Here, *Agave americana* 'Marginata' appear to march down the road.



This quintessential Southern California landscape showcases readily available succulents and companion plants. Blue-gray clusters of *Agave americana* echo drifts of *Senecio mandraliscae* (foreground). Red bougainvillea adds color in summer and autumn; *Aloe arborescens* blooms in winter and spring. Rosemary provides green mounding shrubs, with Canary Island date palms and California pepper trees lending contrasting texture and height. Fairbanks Highlands development, San Diego. Design by Paul Haden, The Collaborative West

SLOPES AND TERRACES

Steep terrain can be challenging to landscape, but it can be fun to explore a garden that you must ascend or descend, especially one that reveals something new at each switchback. When you sit, you are enveloped in greenery, yet you also enjoy the view.

One approach is to cover a slope with ice plants and ignore it—which is what the previous owners of my own garden chose to do. For years, much of the 30-degree slope behind my home was blanketed with *Drosanthemum floribundum*, which bloomed bright purple in spring and, along with oaks, held the soil against erosion. I did not view the terrain as usable land until I created a succulent

tapestry in a level area beyond the slope, and I wanted a sitting area nearby from which to view it. The solution was to dig a flat, semicircular area into the bottom of the slope. Low walls of pressure-treated wood retain the bank, and existing trees shade the area and create a natural roof for the outdoor room. In the bank around the top of the retaining wall, I planted succulents that have filled in and cascade: aeoniums, echeverias, sedums, and kalanchoes. The result is an inviting outdoor room and a sitting area surrounded by a half-wreath of succulents.

Every slope is different and presents its own challenges, but the basic approach to landscaping a hillside is to build retaining walls to form terraces, and then connect these with pathways and steps. If you have a steep front yard that slopes down to a sidewalk, you might build a retaining wall at the base of the bank. The wall will define your yard and serve as a raised bed for flowers, shrubs, and ground covers. The higher the wall, the less steep the slope will be.

Also consider mortarless retaining walls. These have built-in drainage, because moisture seeps between the stones, creating an environment for naturally cliff-dwelling sedums, echeverias, dudleyas, and sempervivums.

Make sure any retaining wall can withstand pressure exerted on it by the slope it holds back. During construction, to enhance stability, dig a trench about



My garden as viewed from the house. The table and chairs are in the succulent sitting area, and beyond is the succulent tapestry. Design by owner Debra Lee Baldwin, Escondido, CA

A retaining wall next to a flight of steps creates a display area for *Agave americana*, *Aloe nobilis*, and *Aeonium haworthii* (foreground). Echoing the red of the stairs is *Crassula coccinea* 'Campfire'. Design by owner Jill Spurgin, San Diego



Pockets within interlocking blocks contain a hybrid haworthia. Another idea is to conceal the blocks by planting a trailing ground cover within them. Design by owner Richard Feltman, San Diego



a foot deep to hold the first course of stone. Angle the wall so that it inclines back slightly into the slope, 2 inches for every foot of height. If a great deal of earth needs to be moved or retained, consult a structural engineer.

Control erosion on steep slopes with plants that knit crumbly dirt together with their roots and produce layers of foliage that lessen the impact of rainwater



Aeoniums, blue senecio, and prostrate rosemary cascade over a series of terraces in Sheryl Crow's garden in Beverly Hills. Design by Jon Goldstein, Jonny Appleseed Landscape Design



A slope is home to a collection of aeoniums and echeverias, with a variegated *Aloe arborescens* in the foreground. Design by owner Suzanne Applebaum, La Mesa, CA

on the soil. If you vary the vegetation, your hillside will be a patchwork of color and texture.

When landscaping an erosion-prone slope, arrange plants in staggered rows. Build a berm on each plant's downhill side, using soil from the planting hole. Water with drip irrigation to minimize runoff, and try to avoid planting into bare soil. To hold in the soil until the plants are established, blanket the area with jute netting, sold by the roll in home and garden centers. The jute will gradually decompose.

Succulent ground covers commonly known as ice plants are a popular choice for steep slopes, because they spread readily and bloom spectacularly. Although such plants diffuse rain and help prevent runoff, their roots are shallow and they will not stabilize the soil as well as a mix that includes larger shrubs and trees.



Chapter Two

Colorful Foliage and Flowers

Blue *Senecio serpens* flows around clusters of *Aloe cameronii* (left); *A. elgonica* (upper right), and starlike *A. dorotheae* (foreground). Adding contrasting color and texture are variegated *Portulacaria afra* and spherical golden barrel cacti (*Echinocactus grusonii*).
Design by Jeff Moore



Graptopoveria 'Fred Ives'



The leaves of *Agave attenuata* 'Variegata' are streaked with yellow. When combined with yellow nasturtiums and red *Kalanchoe luciae*, it resembles a giant corsage. Design by Michael Buckner

Succulents with colorful leaves are the celebrities of the plant world and the darlings of garden designers. People invariably notice a plant with unusual foliage color, be it bronze, blue, silver, gray, crimson, yellow, chartreuse, lavender, or variegated. Because succulents have such glorious foliage, flowers may seem aesthetically unnecessary, but they blaze in hues even brighter than their leaves. They also are long-lasting, both on the plant and as cut flowers. Because fleshy stems hold moisture, the blooms of many succulents—notably aeoniums, echeverias, and kalanchoes—will stay fresh for a week or more in a vase, with or without water.

Grown in mass, succulents with colorful foliage make an unforgettable display. Solo, they serve as the centerpiece of a potted arrangement or as garden focal points. And when one colorful plant is juxtaposed with others and with objects in eye-catching colors, the contrast is as dramatic as it is delightful.



Aloe barbadensis (aloe vera) turns orange-yellow in a hot, dry location; it is green when protected from harsh sun and given ample water.

These striking plants tend to be more rare and costly than their solid green cousins, but you do not need many in the garden to make a statement. Moreover, most can be started by cuttings or division. Consider them an investment that pays dividends—given proper care, they will reward you with offspring.

Some succulents, such as the blue senecios, retain their foliage color regardless of their growing conditions. Others, including *Crassula pubescens*, *Sedum × rubrotinctum*, *Euphorbia tirucalli* ‘Sticks on Fire’, *Aloe brevifolia*, *A. cameronii*, and *A. nobilis*, turn color only when grown in full sun or when stressed by cold or drought. And a few change color depending on the season, climate, and growing conditions. *Graptopervia* ‘Fred Ives’, for example, is a true chameleon (and one of my favorites); its foliage combines peach, rose, blue-green, and lavender-gray in varying intensities.



Aloe vanbalenii reddens when grown in full sun.



Euphorbia tirucalli 'Sticks on Fire'

SUCCULENTS WITH VIVID, COLORFUL LEAVES

On the warm end of the spectrum, succulent leaf hues range from yellow, red, orange, crimson, and purple to glowing pastels. The leaves are dazzling, but these plants also have lovely blooms. In the garden or in containers, they are unforgettable.

Yellow

Crassula ovata 'Hummel's Sunset'

Sedum rupestre 'Angelina'

Yellow-and-green striped

Agave americana 'Marginata'

Agave americana 'Mediopicta'

Agave angustifolia var. *marginata*

Agave attenuata 'Variegata'

Agave desmettiana 'Variegata'

Aloe arborescens 'Variegata'

Furcraea foetida var. *mediopicta*

Yellow, red, and green

Aeonium 'Kiwi'

Aeonium 'Sunburst'

Yellow, orange, and red

Euphorbia tirucalli 'Sticks on Fire'

Orange-red

Aloe brevifolia

Aloe nobilis

Crassula coccinea 'Campfire'

Golden bronze

Sedum nussbaumerianum

Red

Aloe cameronii

Crassula pubescens

Red-tipped green leaves

Echeveria agavoides

Sedum ×rubrotinctum

Sempervivum tectorum

Red and blue-green

Kalanchoe luciae

Rose-red and green

Aloe elgonica

Aloe vanbalenii

Euphorbia trigona

Rose-red, blue-green, and golden yellow

Crassula perforata



Aloe nobilis, when grown in bright, hot sun, turns crimson. Red-and-yellow *Gaillardia* $\times$ *grandiflora* make striking companion plants.

Rose-red, blue-green, and lavender

Graptopetia 'Fred Ives'
named *Echeveria* hybrids

Rose-red, silver, and blue-green

Echeveria pulvinata

Rose-pink

Echeveria 'Arlie Wright'

Pink, green, and white

Sedum spurium 'Tricolor'

Crimson and green

Aloe vaombe



Agave desmettiana 'Variegata' stands out against a burgundy cluster of *Aeonium arboreum* 'Zwartkop', with yellow *Crassula ovata* 'Hummel's Sunset' in the background. Design by Michael Buckner

Kalanchoe longiflora var. *coccinea*

Sedum spurium

Sempervivum hybrids

Purple-pink

Aloe rubroviolacea

Echeveria 'Morning Light'

Purple and green

Aeonium arboreum 'Atropurpureum'

Magenta-black

Aeonium arboreum 'Zwartkop'



The silvery sheen of an *Aloe marlothii* variety contrasts beautifully with its orange-toothed edges and orange-yellow inflorescence.

SUCCULENTS WITH GRAY, GRAY-BLUE, OR BLUE LEAVES

Two or more succulents with gray, gray-blue, or blue leaves can be used to create a surreal combination seldom seen in cultivated gardens. It can also be effective to contrast such plants with those with darker or reddish leaves, such as *Aeonium arboreum* ‘Zwartkop’ or *Kalanchoe luciae*, and with succulents and perennials that bloom in crimson, gold, or orange-yellow.

Blue

Agave attenuata ‘Boutin Blue’
Agave ‘Blue Flame’
Aloe brevifolia
Oscularia deltoidea
Pilosocereus azureus
Senecio mandraliscae
Senecio serpens

Blue-gray

Aeonium haworthii
Agave americana
Aloe elegans



A celadon pot holds a small *Aloe plicatilis*, cascading *Graptopetalum paraguayense*, and fine-leaved *Sedum rupestre* ‘Blue Spruce’. Design by owner Christina Douglas

Light blue-gray

Agave franzosinii
Cotyledon orbiculata
Echeveria ‘Moonlight’
Sedum rupestre ‘Blue Spruce’

Chalky blue-gray

Dudleya brittonii

Gray

Agave gypsophila
Crassula falcata
Euphorbia horrida



Blue *Senecio mandraliscae* makes a stunning backdrop to echeverias in bloom. Richard Feltman garden

Pale gray, silvery green, and rust

Kalanchoe orgyalis

Gray with red edges

Aloe striata

Crassula arborescens

Gray-green speckled with purple

Kalanchoe marmorata

Powdery gray

Kalanchoe pumila

Silver

Senecio haworthii



Gray-green and lavender echeverias, dudleyas, and pen-wiper plant (*Kalanchoe marmorata*) create an unusual wreath. The darker purple accent plant is *Tradescantia pallida* 'Purpurea'. Although cuttings are wired onto a frame and not rooted in moss, such an arrangement will last for months. Design by Judy Casanova, Desert Succulent Creations

Silvery gray

Agave parryi

Dasyllirion wheeleri

Euphorbia stenoclada

Graptopetalum paraguayense

Hechtia argentea

Puya venusta

Sedum spathulifolium 'Cape Blanco'

Fuzzy silver-gray

Kalanchoe beharensis

Kalanchoe tomentosa

Pale blue-gray

×*Pachyveria* hybrids

Lavender-gray

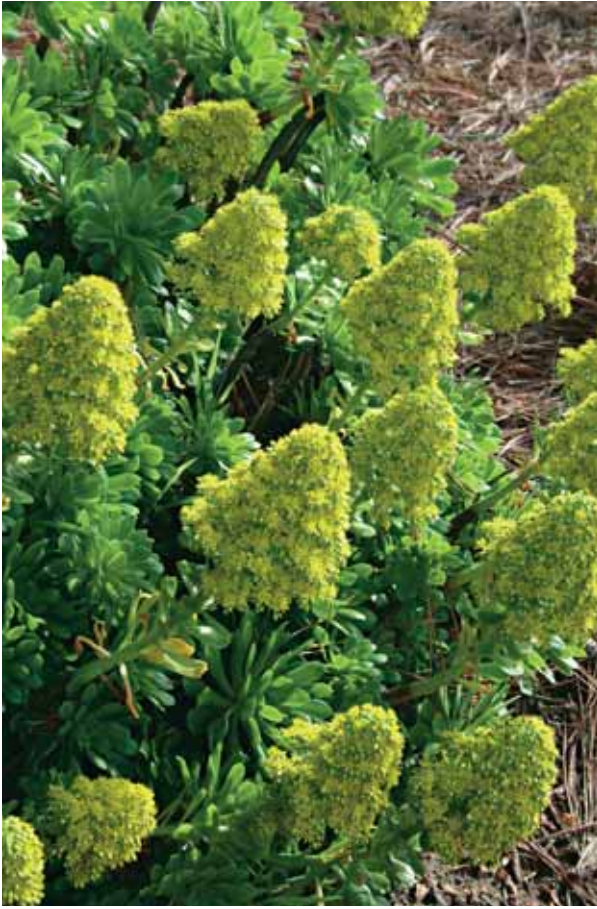
Graptopetalum pentandrum

Kalanchoe fedtschenkoi

Opuntia macrocentra

Pearly lavender-blue

Echeveria 'Perle von Nürnberg'

*Aeonium arboreum**Aloe speciosa*

SUCCULENTS WITH BRILLIANT FLOWERS

Succulents produce some of the most appealing blooms in the plant world. In spring, entire hillsides of temperate-climate gardens are blanketed with the searing hues of ice plant flowers. Aloes send up candelabra-shaped spires—often several feet tall—massed with tubular blossoms that last for weeks. Flowers of *Kalanchoe blossfeldiana* hybrids, commonly sold as tabletop plants, come in a dozen or more colors.

Those mentioned here are my favorites. They are noteworthy for their brilliant hues, are unusual, or are effective when massed.



Bulbine frutescens 'Hallmark'



Calandrinia grandiflora. Design by owner Anne Samstad, Leucadia, CA

Conical spires

Aeonium arboreum
Aloe arborescens
Aloe ferox
Aloe marlothii
Aloe speciosa
Yucca

Delicate and airy

Bulbine frutescens
Calandrinia grandiflora

Branching clusters

Aloe striata
Aloe vaombe
Crassula falcata
Euphorbia milii
Kalanchoe blossfeldiana
Kalanchoe marnieriana

Ground covers

Delosperma
Drosanthemum
Lampranthus
Portulaca grandiflora



Aloe vaombe



Crassula falcata



Euphorbia milii



Kalanchoe blossfeldiana



Delosperma



Drosanthemum speciosum



Lampranthus spectabilis



Portulaca grandiflora hybrid

USING COLOR

Masses of colorful succulents are more effective than blotches, and repetition is enhanced by contrast. Hot hues jump out at the viewer and demand attention, while greens and blues tend to recede. Use yellow, white, and chartreuse to brighten shady spots and red and orange to add punch to areas viewed from a distance. If a part of your garden seems too hot and bright, cool it with a grouping of green plants—such as clusters of *Aeonium canariense* and *Agave attenuata*.

When pairing colors, use them in roughly equal amounts to create a balanced composition. Add a third color to bring out the other two—such as chartreuse with orange and blue. Have fun with complementary hues: juxtapose blue with orange, bright red with lime green, and yellow with purple. (On a color wheel, a *complement* is the opposite color.) The more vivid the contrast, the more memorable the composition.

Complementary colors need not be the same intensity; for example, try pairing a peach-colored plant with deep purple, or gold with lavender. Use touches of white to relieve the monotony of monochromatic arrangements. Mix, echo, and contrast colors, but avoid blending cool and warm reds, which seldom look good together.

Plants with silver-gray leaves may be the most rewarding to work with; they invariably look good wherever you put them. Moreover, at dusk or by moonlight, silvery foliage appears to glow. Plant *Artemisia* ‘Powis Castle’—a perennial with snowflake-shaped, lacy gray leaves—amid your succulents for a delightful color and texture contrast. *Artemisia* especially shines alongside burgundy-black *Aeonium arboreum* ‘Zwartkop’, gold-bronze *Sedum nussbaumerianum*, or a yellow- or red-leaved crassula.



In a striking combination of complementary colors, a granite boulder's gray-blue and rust-red coloration emphasizes the orange-red of *Euphorbia tirucalli* ‘Sticks on Fire’ and *E. milii* blooms, and the blue of *Senecio serpens* and *Agave franzosinii*. Carolyn and Herbert Schaer garden. Design and photo by Michael Buckner

In this sidewalk planting, magenta-black *Aeonium arboreum* ‘Zwartkop’ and purple-blooming *Calandrinia grandiflora* repeat the cool purple-red of the bougainvillea beyond. Blue *Senecio mandraliscae* flows around pork and beans (*Sedum ×rubrotinctum*), which has red and chartreuse leaves and bright yellow blooms. Note the decades-old jade plant (*Crassula ovata*) in the background at left; it is as tall as a tree. Keith Shannon and Peter Pinkerton garden. Design by Amelia Lima





Against an earthy orange wall, this bronze *Aeonium arbo-reum* 'Zwartkop' bud is as appealing as any work of art.



A yellow wall repeats the hues of *Aeonium* 'Sunburst'.
Design by owner Patrick Anderson





A blue garden wall is the color complement of bright orange aloë blooms. Design by owner Patrick Anderson



Red-leaved rosette echeverias and crassula repeat the red of the fence, and blue-toned *Aloe plicatilis*, *Agave americana*, and *Senecio mandraliscae* contrast with it. *Tradescantia pallida* 'Purpurea' adds a vivid punch of purple. Design by Judy Casanova

CREATING COLORED BACKDROPS

When you choose your home's color, think beyond traditional tan, beige, and white. Warm hues of yellow, ochre, and rose make a stunning backdrop for succulents. If you are not courageous enough to repaint your entire house, add color to one exterior wall. This involves little expense or time; if you do not like it, you can simply repaint it.

A red tablecloth makes a cheerful backdrop for a white teapot that contains *Aeonium haworthii* cuttings. Design by Laurie Connable



Blue pots, pebbles, and tumbled glass enhance a whimsical trio of containers that showcases columnar blue *Pilosocereus azureus*. Design by California Cactus Center nursery, Pasadena, CA



A yellow ceramic pot offers a bright contrast to the powdery gray leaves and purple-pink blooms of *Kalanchoe pumila*. Design by Joyce Buckner

PAIRING PLANTS WITH POTS

You can achieve delightful effects by matching or contrasting a succulent's leaf or flower color with that of its container.

Kalanchoe blossfeldiana blooms repeatedly for much of the year, so it is worth the effort to find a pot the same color as the flowers—perhaps bright pink, orange, red, or yellow. Or buy three plants with differently hued blooms and combine them in a single container.

If the trim on your house is white, you might establish a consistent theme of succulents in white ceramic pots. Or, if your metal outdoor furniture has a verdigris (greenish) finish, consider adding celadon-green glazed pots. Paint an



A purple pot mulched with blue aquarium rocks subtly echoes and emphasizes the sherbet hues of this echeveria. Design by California Cactus Center nursery



A milky peach pot mirrors the rosy gold of *Sedum nussbaumerianum*. Design by Barbara Baker

Adirondack chair blue to contrast with orange-blooming aloes, or paint it crimson and situate it near a clump of red-leaved *Aloe cameronii*.

Echeverias that form tight blue-gray rosettes are gorgeous massed in shallow terracotta pots; the earthy orange of the pot is the complement of the leaf color. *Aeonium arboreum* 'Zwartkop' and its hybrids, which have magenta leaves so deep they are almost black, are among the most striking of potted succulents; try them in a lime green pot that picks up the green in the rosettes' centers, or in a rusty urn that emphasizes the leaves' reddish hues.



Chapter Three

Themed and Specialty Gardens

In this desert-themed garden, aeoniums and small aloes combine with yuccas, opuntia, and several varieties of cereus. Design by Michael Theilacker, ASLA. Rancho Santa Fe, CA

Because of their compact and unusual shapes, striking foliage colors, and ease of maintenance, succulents lend themselves to imaginative, nontraditional landscapes that range from practical to whimsical. Succulents can be used as wildfire barriers, for green roof plantings, in rock and boulder gardens and desert gardens, with cacti, and in seaside gardens that tolerate salt spray. This chapter will also inspire you with “succulent-scapes” designed to imitate coral reefs, gardens that are geometric or resemble tapestries, and those that serve as outdoor sculpture galleries.

LANDSCAPING FOR FIRE SAFETY

Unfortunately, no plants are fireproof. In the intense heat of a wildfire, even gel-filled aloes blacken and turn to ash. Succulents, however, are naturally more fire-resistant than other plants, and the thicker and juicier a succulent’s leaves, the longer it will take to catch on fire. At least one home in San Diego’s backcountry was protected during the devastating wildfires of autumn 2003 by a fence of *Opuntia ficus-indica* and *Euphorbia tirucalli*; the fire scorched the plants but proceeded no further.

In 1996, a firestorm burned 100 homes and 8600 acres in Elfin Forest, a rural community north of San Diego. Neighborhood volunteers since have installed a one-third acre Firesafe Demonstration Garden adjacent to the fire station. The garden combines succulents with other drought-tolerant flora to illustrate just how lovely low-fuel, fire-retardant plants can be.

WHY SUCCULENTS ARE FIRE-WISE

Without exception, fire prevention experts advise homeowners to plant succulents because they meet these criteria:

Plant tissues have a high moisture content.

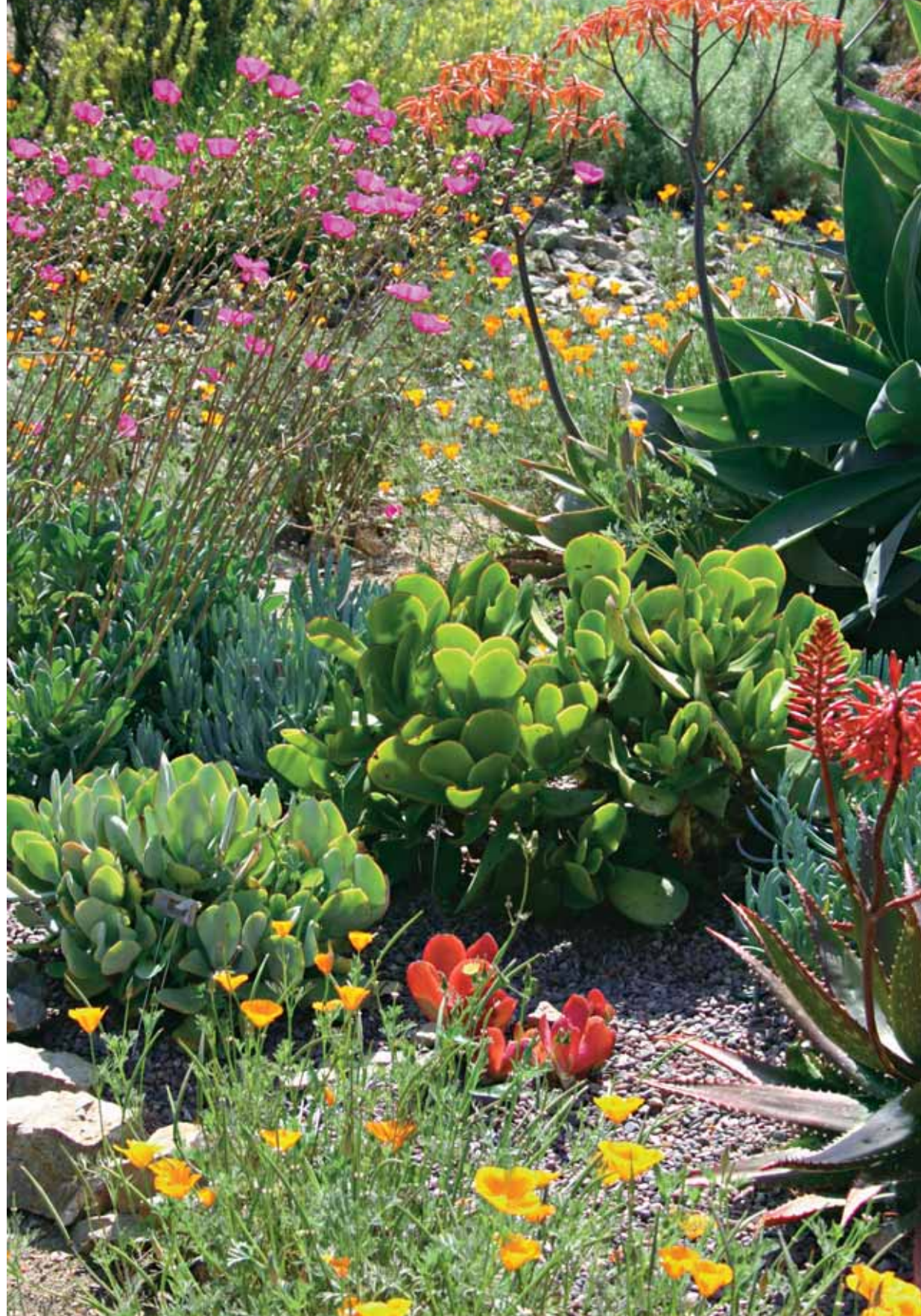
Leaves do not contain flammable oils or other volatile chemicals.

Many varieties grow close to the ground, but even the largest will not provide a fire ladder that enables flames to reach the eaves of a structure.

Plants thrive in dry, sunny areas (typical of fire-prone sites).

Succulents stay green and healthy with minimal irrigation, so they are suited to perimeter areas that receive less water than those closer to the structure.

Plants of the Elfin Forest Firesafe Demonstration Garden in spring (by flower color): *Calandrinia grandiflora* (purple), *Bulbine frutescens* (yellow), *Eschscholzia californica* (yellow-orange), and aloes (coral). In the midground, not in bloom, are gray and green varieties of *Cotyledon orbiculata* and red-leaved *Kalanchoe luciae*.



Along this property line is an impenetrable security fence composed of cacti and other succulents, including *Agave angustifolia*. The fence also serves as a wildfire barrier. Design by owner Bobbi Hirschhoff



GREEN ROOF GARDENS

Another way to use succulents as fire-retardant plants is to grow them on rooftops. Succulents can make the roof an “extinguisher” of sorts.

Shallow-rooted sempervivums, sedums, and portulaca are ideal for green roofs, which present an environmentally friendly alternative to more traditional roof systems. In many cities, little or no land remains for parks, but an abundance of rooftops can serve as green spaces. Green roofs soften the glare of concrete, glass, and asphalt by providing a cool and appealing patchwork of plants. They also offer the opportunity for office workers and apartment dwellers to enjoy garden views high above the ground. Plants grow in a thin layer of soil and are watered by rain, or by drip irrigation in a dry climate. (A green roof requires a minimum of 25 to 30 inches of rainfall per year.) To enhance floral color and add textural interest, succulents can be interspersed with annuals and accent plants.

The concept seems counterintuitive: Will not a roof that stays constantly wet rot more quickly than a conventional one? Surprisingly, a properly installed green roof will last longer than its traditional counterpart (on average, 30 years). A green roof uses protective layers that shield the structure from wind, water, ice, and the sun’s ultraviolet rays. First, a waterproofing membrane is applied to protect the building from moisture and root penetration; next, a layer of growing medium is added; and finally, plants suited to the climate and conditions are installed. In some areas, the cost—about 30 percent more than a conventional roof—may be defrayed by government rebates.



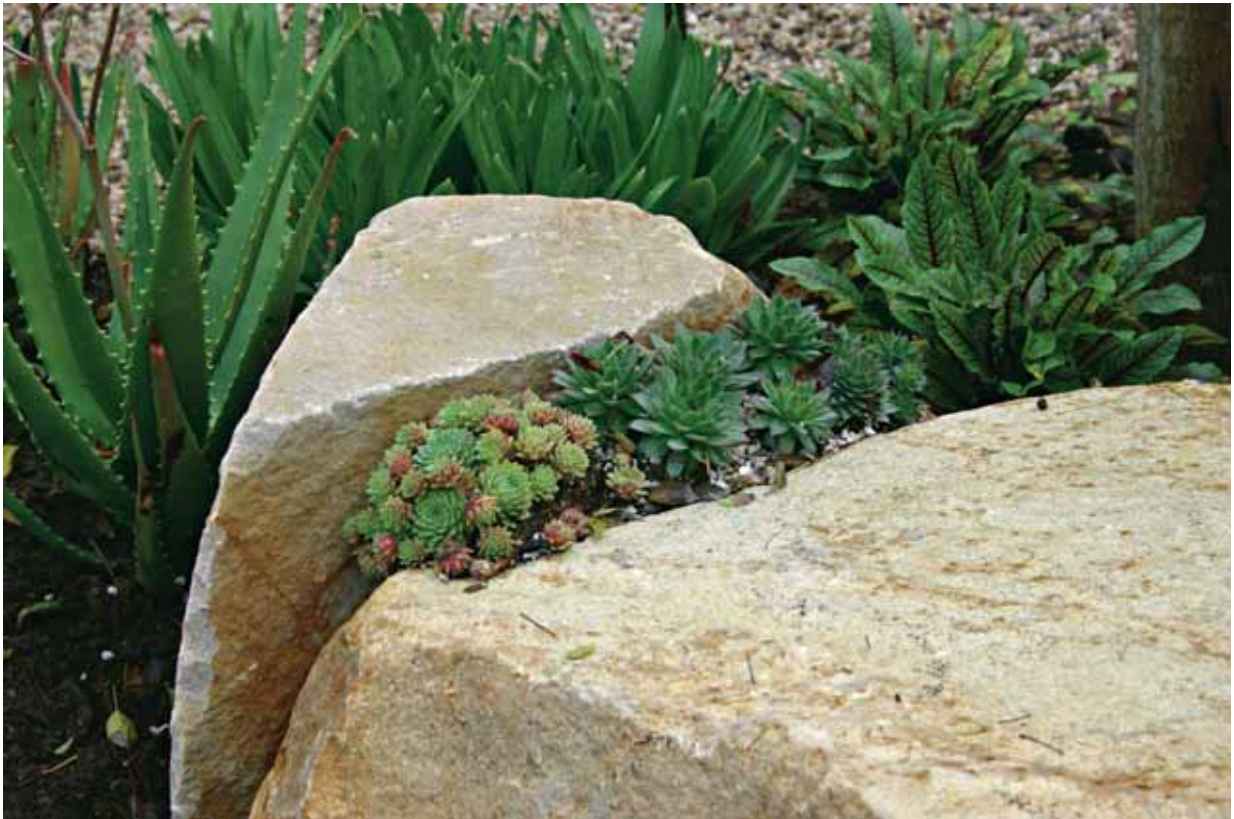
This green roof planted with *Sedum floriferum* is atop Hamerschlag Hall on the campus of Carnegie Mellon University in Pittsburgh. The rooftop is being used to determine and record the environmental benefits that green roofs provide. Photo by Doug Oster

Green roofs also are appearing in the Washington, D.C., area. Local media praised one atop a condominium complex, planted with ground cover succulents, as a living kaleidoscope. That particular roof combines *Sedum album*, *S. rupestre*, and *S. sexangulare*—three of 50 varieties of *Sedum* hardy to the area.

Green roofs also mitigate the “heat island” phenomenon that takes place in urban areas during the hottest months of the year. When utility rates and usage peak in mid-afternoon, green roofs significantly lower temperatures, saving energy and money and making cities safer for heat-susceptible residents—while visually enhancing the environment.

BOULDER AND ROCK GARDENS

Boulders are wonderful enhancements to succulent gardens. If you are fortunate, your property already has some large rocks you can incorporate in your design. If not, landscape retailers specialize in everything from pea gravel sold by the sack to stones that have to be lowered into place with a crane.



Patrick Anderson filled a gap between boulders with soil and planted it with sempervivums. The flat rock on the right provides a place for visitors to sit and admire the small succulents and garden beyond.

There are many beautiful types of decorative rock, including Arizona sandstones with swirling patterns. But before you select something exotic, keep in mind that it may look out of place; it is worth the effort to find rocks and boulders that are the same color as those that naturally occur in your area and that blend with your soil.

From a design perspective, granite boulders are much more than big gray rocks. They are opportunities to provide contrasting texture and to repeat foliage color—especially when they include rusty veins and silvery patches that echo similarly colored succulents (such as *Aloe cameronii* or *Kalanchoe orgyalis*). Flat-topped rocks can also serve as benches when positioned alongside pathways or patios. When placing a boulder, do not situate it in such a way that you can see its underside; even though you know it is stable, it will not appear to be so and may strike a discordant note.

Escondido, California, resident Christina Douglas solved a rattlesnake problem by filling fissures in her garden's granite boulders with concrete so the creatures could no longer hide in them. Masons also created stone-paved pathways amid the boulders and rock dams to hold soil. Succulents and other plants thrive in such basins, because the stones retain heat and moisture.



The lower end of this rock crevice in Christina Douglas's garden is dammed to hold in soil. Plants growing in the basin include *Aloe striata*, *Bulbine frutescens*, *Sedum rubrotinctum*, and *Senecio serpens*.

Bright green *Echeveria pallida* (in bloom) grows atop a pile of rounded river rocks at the Huntington Botanical Gardens. In the background is a cluster of *Agave celsii* var. *albicans*, and nestled amid the rocks are blue *Echeveria imbricata*.





My garden's succulent tapestry, with *Aloe striata* in bloom. Design by Debra Lee Baldwin

SUCCULENT TAPESTRY GARDENS

For years, the focal point of my own garden was a rectangular bed of 15 rosebushes planted in rows. It was lovely in spring, but in winter it became an 11-by-22-foot bed of naked, thorny branches sticking up at regular intervals. Each pruned bush had its own neatly mulched basin, but basically the view from the living room windows was of dirt.

Inspired by geometric gardens I had seen in Europe, I decided to remove the rosebushes and turn the bed into a succulent tapestry.

Because the bed was rectangular, it lent itself to triangular and diamond-shaped sections. To create equal-sized planting areas, I extended string from corner to corner and from the middle of each side to the opposite. I then planted each section with low-growing succulents with contrasting foliage: blue-gray *Oscularia deltoides*, fine-leaved *Sedum spurium* 'Tricolor', red-and-green *Sedum x rubrotinctum*, *Graptoveria* 'Fred Ives', rose-red echeverias, and variegated aeoniums. To add height and interest, I planted the center of each of the four corners with star-shaped *Aloe striata*. At the middle of the rectangle went fountain-shaped *Agave americana* 'Marginata'. To suggest rings formed by a fountain's splashing water, I circled the agave with clumping *Aeonium canariense* rosettes.

After the succulents were in place, I removed the string and outlined each section with *Dymondia margaretae*, which in a few months formed an interlocking mat of narrow gray-green leaves. The dymondia pathways withstand foot traffic and enable access to all areas of the tapestry, so I can weed, deadhead, and divide the succulents without stepping on them.

Succulents—many of which were cuttings—filled in within six months. Two years later, the plants have grown so the pattern is no longer crisply defined, but the tapestry is lush and tidy, requires minimal maintenance, and enhances the view from my home's windows year-round. Best of all, this 240-square-foot area of the garden uses two-thirds less water than required by the rose garden and produces flowers that are showy and long-lasting.



Like *Agave guiengola* growing nearby, this contemporary sculpture in Patrick Anderson's garden is silvery and husky. In the foreground in bloom are several *Aloe* 'David Verity', a hybrid of *A. speciosa* and *A. petricola*. Design by Patrick Anderson



A sprinting figure atop a pole adds whimsy and the suggestion of motion to this section of Patrick Anderson's garden. In the foreground are *Aloe marlothii* blooms (left), *Agave angustifolia* var. *marginata* (center), and *Aloe speciosa* (right).

ART GALLERY GARDENS

The architectural and sculptural qualities of agaves and other large succulents beg for the juxtaposition of *objets d'art*. Turning your garden into an art gallery will enhance your enjoyment of it as an outdoor living space and make it more dramatic and memorable.

If you are uncertain how to choose outdoor artwork, begin by taking into consideration your home's architecture, or choose an element of continuity that unifies the objects you select. This might be color, materials (such as mosaic), style (such as rustic or contemporary), or a theme (cats, perhaps, or antique farm tools). But try to avoid clichés. Your garden is unlike any other, so do not clutter it



A large cluster of *Agave attenuata* makes a dynamic backdrop for a statue of Saint Francis. Phyllis and Bill Munster garden, San Diego. Design by Michael Buckner

with cow skulls, plaster coyotes howling at the moon, broken wagon wheels, or signs with trite phrases.

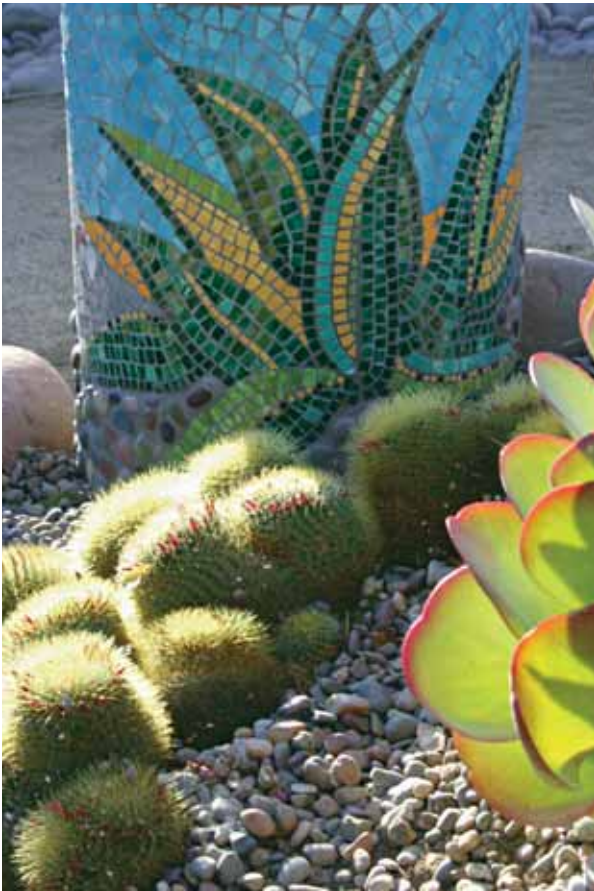
Obviously, art is highly individualized, and what delights one person may be unappealing to another. In my opinion, most decorations sold in garden shops and the garden departments of large retailers look out of place in a succulent landscape. Whirligigs, Victorian birdhouses, floral flags, and bunnies with bow ties—anything considered darling or cute—is better suited to the flowerbeds of a cottage garden. Such tchotchkes detract from the elegance and dignity of succulents. I even caution you to think twice before adding those pretty things seen in gardens everywhere—planted wheelbarrows and gazing globes—unless you use them in clever or innovative ways.

If something so subjective can be generalized, I would venture to recommend that you choose one-of-a-kind rather than mass-produced pieces. As for what such art might be, the answer is anything weatherproof you find tasteful and would enjoy seeing daily. Consider hunting for objects with intriguing shapes at flea markets and suppliers of architectural salvage. One memorable East Coast garden I visited—with a recycled objects theme—used box springs from an old bed as a trellis roof and vine support. The rusty coils offered pleasing repetitions of form and looked as organic as the vine's tendrils.

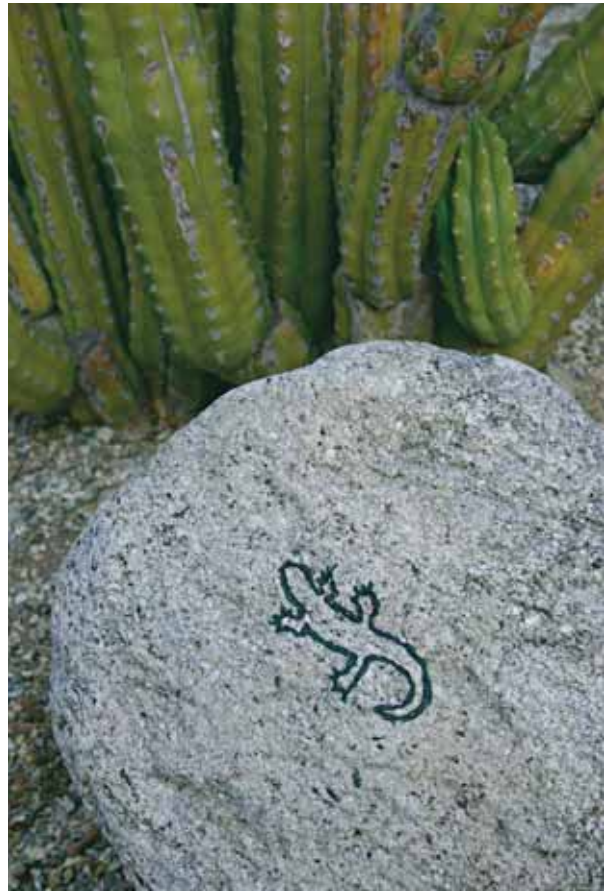
Principles of garden design apply to positioning artwork. Objects should be in scale with their surroundings and contrast with or repeat other garden

elements. When arranging a collection of small objects in your garden, group them near a sitting area. Also try varying the height at which you display them. Hang them from tree branches, set them atop boulders or pedestals, and place them along pathways.

Decorative objects can disappear against a backdrop of foliage. If possible, position them in silhouette, with the sky or a blank wall behind them. If the items are not “fine art,” paint them to make them stand out. For example, I bought several wire sculptures for my garden, but they blended too much with surrounding plants. I took a euonymus leaf to the hardware store and had paint mixed the same yellow. The wire forms, now painted yellow (after being primed with a waterproofing paint) are clearly visible and harmonize with a hue found throughout the garden.



A mosaic of an agave transformed an eyesore—the base of a light pole—into the focal point of a garden vignette at the Water Conservation Garden in El Cajon, California. Garden design by Michael Buckner. Mosaic by Patricia Kaszas



A lizard stencil on a rock illustrates that garden art need not be immense or expensive to be appealing. Pitzer College desert garden, Claremont, CA

DESERT AND CACTUS GARDENS

A note on taxonomy

In the early days of cactus classification, *Cereus* denoted columnar forms, *Opuntia* had jointed stems, and *Echinocactus* were fat and short. Now more than 100 named genera exist, but it is still helpful to keep in mind the three main types when designing with cacti.

If the spiky textures and austere shapes of cacti appeal to you, and you live in a dry climate, by all means incorporate these plants into your garden.

Cacti mentioned here are readily available at specialty nurseries and offer outstanding value as landscape plants. They also work well in combination with soft-leaved succulents.

Aporocactus flagelliformis is commonly called rat-tail cactus for its slender stems, which are several feet long and about an inch in diameter. Though bristly, they are surprisingly soft to the touch. It is native to Mexico, has crimson blooms, and is a wonderful plant for hanging containers.

Cephalocereus senilis, or old man cactus, is a columnar form completely covered with soft white filaments, like an old man's beard. This native of Mexico grows wild on dry, scrubby, rock-strewn hillsides, where it will attain heights of 25 feet or more (though it is seldom seen larger than 4 feet in gardens). Use it as a novelty and in container groupings. A similar columnar cactus, also covered with white hair, is *Cleistocactus strausii* (silver torch) from Bolivia (to 8 feet).

Cereus peruvianus, the most commonly cultivated *Cereus*, is native to South America. Columnar branches grow to 15 feet tall and about 12 inches in diameter. These produce vertical branches that eventually form 10-foot-wide shrubs. Each branch of gray-green *C. peruvianus* has ribs bearing stiff gray spines. Large and intensely fragrant, creamy white flowers emerge at night in summer, eventually followed by yellow fruit. *Cereus peruvianus* 'Monstrosus' is a knobby column with ribs that resemble melted wax. Both varieties make strong vertical statements in the landscape when used as focal points, silhouetted against walls, or positioned as dramatic background plants.

Echinocactus grusonii (to 3 feet in diameter), commonly known as golden barrel cactus, is one of the most useful plants for textural interest. These ribbed, light-green spheres are covered with inches-long, downward-curving, butter-yellow spines that glow beautifully when backlit by early morning or late afternoon sun. Native to Mexico, golden barrels can take drought, frost, full sun, and desert heat. Few plants provide the dramatic impact of golden barrels planted *en masse* to emphasize the pleasing harmony of their globular shapes. They also look good in random groupings—where they appear to roll across the landscape—and are striking when grown solo in circular pots. As they age, they may produce offsets that form odd and whimsical clumps. Yellow flowers form a ring around the crown in summer.

Echinocereus, commonly called hedgehog cactus, is a popular genus of nearly 50 species of small cacti from Mexico and the Southwest. All have ribbed, cylindrical stems that form offsets and produce showy, multi-petalled flowers in spring. These stay manageably small (to 12 inches in diameter).

Ferocactus literally means fierce cactus. These ribbed and spiny barrel cacti are spherical when young and cylindrical as they age. In their native habitat



This five-year-old cactus garden includes specimens that were large when planted—such as a magnificent trichocereus, at far right. *Aloe thraskii* lends vertical interest; spherical *Echinocactus grusonii* adds contrast and texture. Prior to planting, the homeowners mounded the area with a mix of two-thirds decomposed granite and one-third cactus mix. Plants are mulched with golden crushed rock. A swath of lawn along the sidewalk creates continuity with neighboring yards. Design by owners Chris and Margaret Sullivan, San Diego

(Mexico and the Southwest), they form massive clumps. Some varieties have red spines that glow fire-bright when backlit.

Fouquieria splendens, commonly called ocotillo, is also native to the Southwest and Mexico. These airy, vase-shaped shrubs are unmistakable, with their tall, slender limbs tipped with bright red blooms. They are frost tender and must have a dry winter, fast-draining soil, and full sun; they tend not to do well away from their native desert environment. A look-alike with less stringent cultivation requirements (one that will tolerate cool coastal temperatures) is *Alluaudia procera*.

Mammillaria is a large genus with more than 100 species; all are spherical and form mounds that resemble spiny stacked balls. Use them to fill bowl-shaped pots and as appealing accents in rock gardens.



Echinocactus grusonii contrasts beautifully with chalky blue *Senecio serpens*. *Opuntia microdasys*, left, repeats the green and yellow of the golden barrels. Huntington Botanical Gardens, San Marino, CA. Design by Joe Clements



In this elegantly simple landscape, spheres of golden barrel cactus line raised stone beds and emphasize the hard-
scape's graceful curves. Dark gray river rock enhances the composition and serves as mulch.

Opuntia is the most widespread and numerous genus of cactus, with more than 200 species ranging from the southernmost tip of South America to as far north as Canada. *Opuntia* have showy blooms and paddle- or cylinder-shaped stems linked one to another. Spines range from polka-dot tufts to long, wicked needles. *Opuntia* commonly called cholla have cylindrical joints that break off easily. Though beautiful when backlit, cholla is not a good choice for cultivated gardens, as it spreads readily and is viciously barbed.

Opuntia basilaris, or beavertail cactus (to 1 foot high and spreading to 4 feet), has gray-green pads and rose-purple flowers. *Opuntia macrocentra* (syn. *O. violacea*) (to 4 feet tall and 6 feet wide), is striking in any setting, with pads that vary in color from green to lavender-pink. Position it prominently and use it in



Immense golden barrel cacti at the Huntington Botanical Gardens lean slightly in the same direction (toward maximum sun exposure), which creates a sense of motion. The columnar cactus at right is *Trichocereus pasacana*. In the foreground, providing dramatic contrast to the golden barrels—and preventing people from cutting across an adjacent lawn—is *Agave americana*. Design by Joe Clements

Cacti dominate the desert landscape of this home in Scottsdale, Arizona. A slender, red-tipped ocotillo (*Fouquieria splendens*) repeats the red of bougainvillea growing against the wall. At left, providing light shade, is *Parkinsonia aculeata* (Mexican palo verde). Design by owner Clint Miller. Photo by Dency Kane





Delicate spines of *Mammillaria bombycina* echo the color and shape of a glazed terracotta container. Note the complex patterns within the orbs and how the smooth, shiny surface of the pot contrasts with the fuzzy plants.

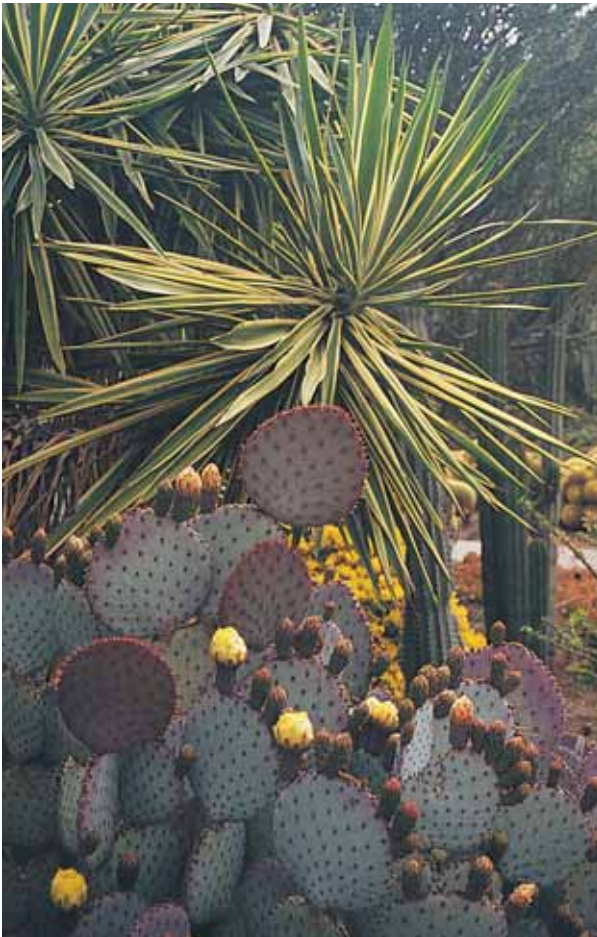
groupings with succulents that have similarly colored or contrasting leaves.

Opuntia microdasys (to 3 feet high and 4 feet wide) is commonly called bunny ears for the shape of its pads, which are dotted with yellow tufts. A white variety is *O. microdasys* var. *albispina*. *Opuntia ficus-indica* (to 15 feet tall and 10 feet wide) is grown in Mexico as a hedge to define property boundaries. Its fruit is the edible red prickly pear.

Pilosocereus azureus, a columnar cactus, is an amazing azure blue. No other plant is quite like it; it resembles a pale blue baseball bat. One of these in a pot, perhaps mulched with blue glass florist's beads, is all that is needed for a focal point and conversation piece. For maximum impact, group several in pots of varying sizes. If you combine *P. azureus* with other plants, keep the arrangement simple. For example, place three red-leaved *Kalanchoe luciae* plants around it, or underplant it with *Crassula coccinea* 'Campfire'. Position *P. azureus* in a yellow pot against a backdrop of bright yellow *Crassula ovata* 'Hummel's Sunset', or create a monochromatic arrangement in combination with blue *Senecio serpens*, which repeats the color and form of the cactus.

Stenocereus thurberi (syn. *Lemaireocereus thurberi*), commonly called organpipe cactus or Mexican fence post, is similar in silhouette to *Cereus peruvianus*. However, it branches from the base, and each stem has 12 to 19 ribs, giving it a crenellated look. Clumps grow slowly to 15 or 20 feet and may eventually form as many as 30 stems, each 6 inches thick.

Trees and shrubs with cultivation requirements comparable to cacti and that are suited to desert gardens include *Abutilon palmeri*, *Cercidium* and *Parkinsonia* species (palo verde), *Chilopsis linearis* (desert willow), *Encelia farinosa* (brittle bush), *Prosopis* species (mesquite), *Pithecellobium flexicaule* (Texas ebony), *Leucophyllum frutescens* (Texas ranger), and *Tecoma stans* (yellow bells).



At the Huntington Botanical Gardens, yellow flowers complement the lavender leaves of *Opuntia macrocentra* and repeat the yellow of variegated *Yucca aloifolia* and *Crassula ovata* 'Hummel's Sunset' growing behind it. Oval cactus pads also contrast in shape and texture with the yucca's lance-shaped leaves.



Cacti and succulents in a variety of heights, textures, and forms grace a hillside at Tropic World Nursery in Escondido, California. Adding bright red is ground cover *Drosanthemum speciosum*. The shape of the agave in the foreground is echoed by leaves of the yucca in the background. Majestic, multi-branched *Aloe barberae* is striking silhouetted against the sky. Note how the rounded paddles of opuntia—though covered with spines—look soft relative to the spiky-leaved succulents.



Agave americana and *Pinus torreyana*. Design by owner Marlene Reynolds, La Jolla, CA

BEACH GARDENS

Succulents that thrive in sand and do not mind salt spray, and therefore grow well in warm-climate beachfront gardens, include *Agave americana* and *A. attenuata*; *Aloe arborescens*, *A. barberae*, and *A. thraskii*; *Crassula ovata*; *Dracaena draco*; *Stapelia* species; and *Yucca aloifolia*. *Carpobrotus edulis* also is an option but is invasive; plant it only where nothing else will grow. Companion plants include *Carissa macrocarpa* (natal plum), *Dietes bicolor* (fortnight lily), *Echium candicans* (pride of Madeira), *Euryops pectinatus* (freeway daisy), *Lantana montevidensis*, *Strelitzia reginae* (bird of paradise), and various pine and palm trees.



Agave attenuata flower spike



Variegated *Yucca aloifolia* and orange *Aloe arborescens* blooms

SEA-THEMED SUCCULENT GARDENS

The fact that many succulents resemble the marine life of coral reefs inspired Jeff Moore, owner of Solana Succulents nursery in Solana Beach, California, to create award-winning undersea succulent-scapes for Sea World, the San Diego County Fair, the Philadelphia Flower Show, and Quail Botanical Gardens in Encinitas, California. On a smaller scale, such designs can grace private gardens and can even be planted in wide, shallow bowls.

In addition to his own snorkeling explorations, Moore's sources of design inspiration include photos in *National Geographic* and displays in public aquariums. He says the key to getting the right look is to create canyons, because an undersea reef is not flat. Start with as many lava rocks as you can find, because most coral reefs are volcanic. (Lava rock resembles a sponge and is lightweight; it is full of holes formed when the rock was molten and foamy.) Build vertically or on a slope, so when you look at the seascape, you get a sense that you are in the midst of it.

Moore stockpiles rocks so he will have plenty when he begins designing and arranging. He recommends accumulating multiples of plants, because a seascape looks more natural with clusters and repetitions.

After stacking rocks to suggest a reef, fill crevices with potting soil and tuck plants (or callused cuttings) into them. Mulch with fine pea gravel the same color as the rocks, and cover the canyon floor with white sand. You also might add props—such as a rusty anchor and chain or half-buried urns that resemble amphorae (perhaps planted with an aporocactus that suggests a moray eel).

Cacti and succulents that are *crested*—a term that refers to a tendency to form tight, convoluted mounds—are desirable in a succulent seascape because they resemble coral. However, crested cacti are rare, slow-growing, and expensive. Include two or three, if your budget allows, with other plants—particularly euphorbias—that are more common and also provide a similar effect.

Part of the fun of creating a succulent reef is seeing common plants in a fresh, new way. Before you know it, those you have taken for granted will strike you as having “undersea” potential. Although many kinds of cacti will work, try to avoid anything that connotes a desert landscape or has spines so stiff it will not appear to ripple. Do not use plants with leaves that suggest a terrestrial garden; instead, look for those with smooth branches and insignificant foliage.

Ceramic artist Jolee Pink created a succulent seascape with Moore's help and extended the undersea theme with a mural of fish and swimming tortoises. Along walkways, Pink installed low-voltage Malibu lights, replacing their metal

In the sea-themed succulent garden at Quail Botanical Gardens, aloes, crassulas, portulacaria, and crested cacti grow amid lava rocks stacked to resemble a reef. An alluaudia limb that bisects the composition enhances the illusion; it appears to sway in an ocean current. Design by Jeff Moore and Bill Teague





Blue-crested *Myrtillocactus geometrizans* at Quail Botanical Gardens. Design by Jeff Moore and Bill Teague



In the Encinitas, California, garden of artist Jolee Pink, a mural by Karen Athens enhances the fantasy, and *Aporocactus flagelliformis* in hanging baskets suggest jellyfish. In a bed of crushed lava rock, pencil-thin stems of *Euphorbia tirucalli* 'Sticks on Fire' resemble coral. Red blooms in the foreground are *Crassula falcata*. The pathway is paved with smooth, oval river rock.

shades with large seashells. At night, the lit shells glow to reveal their spiral patterns. When placed at the base of aloes or agaves, the lights emphasize the plants' undulating lines. Pink also painted a fence cobalt blue and stamped it with a random pattern of seashells, fish, and seaweed. (She cut stamps out of closed-cell foam sold at craft stores, and dipped them in white paint.) The fence serves as a backdrop for pots planted with *Senecio rowleyanus* (string of pearls), starfish-shaped aloes, and assorted small succulents.

Hollow, ball-shaped sea urchin shells make charming pots for tiny-leaved sedums and sempervivums. Line the hole in the bottom of each shell with a piece of fine-mesh aluminum window screen, and fill with potting soil. Insert succulent cuttings, and set the mini pots in a shallow tray or basin filled with white sand (or simulate beach sand with a mixture of four parts perlite to one part vermiculite). Decorate your mini beach with chunks of tumbled glass and additional seashells.

Marine life look-alikes

Coral (branching): *Euphorbia tirucalli* 'Sticks on Fire'

Coral (knobby): *Myrtillocactus geometrizans*

Coral (overlapping): *Kalanchoe luciae*

Eel grass: *Euphorbia leucodendron*, *Senecio mandraliscae*

Jellyfish tentacles: *Aporocactus flagelliformis*

Kelp: *Sansevieria trifasciata*

Octopus: *Agave vilmoriniana*

Sea urchins: *Euphorbia flanaganii*, *E. caput-medusae*, *E. horrida*, and *E. polygona*

Sponge colony (when clustered): *Euphorbia obesa*

Starfish: *Dyckia marnier-lapostollei*, small agaves and aloes



A ceramic clam by Jolee Pink nestles between flat, red-tipped paddles of *Kalanchoe luciae* and green tentacles of *Euphorbia caput-medusae*. Design by Jolee Pink and Jeff Moore

Peter Bailey's barrel cactus
checkerboard



GEOMETRIC PLANTINGS

One of the most intriguing ways to landscape with rosette succulents or globular cacti is to plant them in rows to create geometric arrangements. Such repetitions are Zen-like in their simplicity and through the design principle of repetition perfectly showcase the plants' forms. You might do this in a level area of your garden or in a series of square pots.

Peter Bailey, an engineer from Escondido, created a checkerboard of golden barrel cacti in an area of his back yard most often viewed from upstairs windows. His concept follows the time-honored tradition of English knot gardens and French allées of shrubs pruned into balls, yet it has a contemporary look suited to the Southwest.

To build his barrel cactus checkerboard, Bailey first installed drip irrigation lines, so the cacti could be watered during the dry summer and autumn months. Next, to prevent the encroachment of weeds, he lined the 700-square-foot area with black plastic. After positioning 25 concrete pavers 2 feet apart to create a grid, he cut into the plastic and planted the cactus in the intersections, and then paved exposed areas with crushed rock. To add an element of contrast and whimsy—and to tie the garden to the larger succulent garden beyond—he replaced one of the squares with a tree aloë.

Professional landscape designers Russ Johnston and Denny Smithgall of SJA Inc. were commissioned by Pardee Homes in San Diego to create a drought-tolerant, multi-functional garden surrounding a fire pit. The garden is at a model home in Soleil, a newer housing development, and unlike the Bailey checkerboard, it is intended as an outdoor room for entertaining. The designers defined



In this geometric garden, succulents surround a fire pit. At each of four corners, adding height and providing contrast of form, are slender *Dracaena marginata* trees in spherical pots. These are echoed by large, urn-shaped fountains along the far wall. In beds are red-leaved *Aloe vaombe*, slender-leaved yuccas, green *Agave desmettiana*, and ornamental grasses. Lining the garden's perimeter are *Aloe striata*, which bloom bright orange in midwinter, and *Agave vilmoriniana*. Soleil garden, San Diego. Design by Russ Johnston and Denny Smithgall, SJA Inc.



Outdoor lighting and a fire add drama to the garden at night. Photo by Lance Gordon

planting beds using gravel, concrete, and perimeter walls. Stair-stepped hardscape—squares within squares—provides casual seating. Fluffy plants in beds would have detracted from the design’s visual dynamism, so star-shaped and spiky succulents were used instead.

SUCCULENT LABYRINTH GARDENS

An unusual way to enjoy small succulents up close is to use them to landscape a garden labyrinth—a pathway that follows a convoluted pattern to the center, where a visitor turns and follows the same path out. Walking a labyrinth is a relaxing form of meditation, and unlike a maze, it presents no dead ends or puzzles to solve.

Labyrinths are found worldwide, in numerous cultures. The most famous pave the floors of cathedrals in Europe. During the 1990s, the labyrinth at Chartres Cathedral in France was duplicated in San Francisco’s Grace Cathedral. In addition to public and private gardens, labyrinths sometimes are found at resorts, health spas, and educational institutions.

As you walk a labyrinth, take your time and let your mind wander. Many people find the experience to be a metaphor for the path of their own lives. They attain clarity on past events and are better able to plan the future. Perhaps because the loops of a labyrinth resemble those of the cerebral cortex, walking the pathway can have a profound impact on the subconscious, helping people to untangle problems, feel at peace, and restore a sense of equilibrium and contentment with life.

A labyrinth’s circuitous pathway can be paved, leaving room between the loops for plants, or it can be left unpaved. The area should be level, with enough room to accommodate the pattern. Labyrinths can be as small as 25 feet in diameter, but they can range to 100 feet or more. The Chartres labyrinth, because of the complexity of its design, takes up as much as 90 square feet (with 2-foot-wide paths and 1 foot of garden space between them). A simpler pattern better suited for residential gardens is the classical seven-circuit.

Books and articles have been written about the restorative benefits of labyrinths, and some professional landscapers specialize in installing them. For more information, visit the Labyrinth Society’s website, www.labyrinthsociety.org.

At the California Center for Creative Renewal in Encinitas, *Sedum ×rubrotinctum* grows in mounded soil between loops of a classical seven-circuit labyrinth. Nestled amid the succulent ground cover are objects intended to provoke thought and enhance the meditative experience. Design by owner Ellen Speert



Smooth river stones line the mounded beds of the labyrinth





Chapter Four

Pots, Wreaths, and Container Gardens

An eclectic pot grouping transforms a flight of tiled steps into a container garden.
Santa Monica, CA. Design by Mary Effron. Photo by Lisa Romerein



In this complex arrangement, coral blooms of *Kalanchoe blossfeldiana* contrast with the powdery purple-blue leaves of *Aloe rubroviolacea* and cascading *Crassula perforata*. Design by Janet Sutor

You do not need a plot of land to create a gorgeous succulent garden. Succulents can be potted and grouped on patios, balconies, decks, entryways, and sitting areas—any place that receives adequate light. And because pots can be moved indoors or beneath a shelter, they make it possible to cultivate succulents that might not thrive in the harsher environment of your yard. You can also create succulent wreaths or topiaries to hang on walls or display on tabletops.

Unlike potted annuals, which need to be replaced seasonally, and perennials that need repotting after a year or two, succulents tend to last three or more years in containers, depending on the variety.

Among the most dramatic potted succulents are single specimens with crisply defined geometric shapes, such as *Agave victoriae-reginae* and *A. parryi*. Also pleasing are single-variety pots of clump-forming rosettes, such as aeoniums, echeverias, and sempervivums. If you combine more than one type of succulent in a potted arrangement, the design possibilities are endless.

A rule of thumb is the fancier the pot, the simpler the planting, and vice versa. This keeps the two design elements from competing for attention. Consider a tidy, globe-shaped euphorbia in a fancy Oriental urn, for example, or use a simple clay pot for a busy arrangement.

DESIGN PRINCIPLES FOR POTTED ARRANGEMENTS

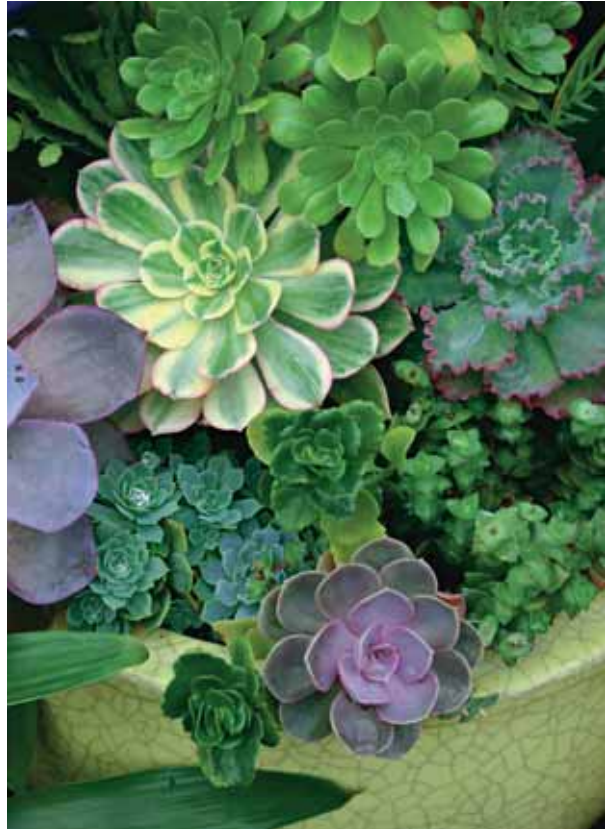
Design principles for containers are drawn from floral arranging and apply to in-ground vignettes as well.

Lushness tends to be more pleasing in pots than sparseness, so pack your plants or cuttings tightly—unless you do not mind waiting several months for them to fill in. Once they start to grow and get leggy, trim them back and use the cuttings to fill gaps or to create new arrangements.

Balance is an overall sense of unity and stability. Regardless of the angle from which it is viewed, a balanced composition is neither lopsided nor top-heavy. You can create an asymmetrical arrangement and still achieve balance. If the pot will be viewed from all angles, create a pyramid shape—high in the center, low on the sides.



A spherical urn emphasizes the circular shape of *Euphorbia caput-medusae*. Design by owner Barbara Baker



Aeoniums and echeverias massed together create an abundant display. The rosette shapes of the succulents suggest a bouquet, and the pale yellow pot echoes the color of *Aeonium* 'Sunburst'. Design by California Cactus Center nursery

Scale and *proportion* refer to the relationships among an arrangement's components. Scale has to do with the size of objects; proportion, with areas and quantities. For example, a large, heavy container would be out of scale with small, delicate succulents.

Rhythm is the way the viewer's eye moves through an arrangement. Also called *flow*, it sustains interest and engenders a sense of beauty. Rhythm comes from repetitions of color, size, shapes, and textures that may be subtle or prominent.

Contrast emphasizes the differences between two elements and, in so doing, brings both into greater prominence. It also spices up an otherwise lackluster arrangement.



This dish garden is a fiesta of color and texture. Assorted same-sized cacti are in scale with the turquoise container and with each other. Sand-colored pebbles provide the perfect finishing touch. Design by California Cactus Center nursery

Create a miniature landscape

A shallow terracotta bowl can contain an entire garden and makes a wonderful tabletop display. Lilliputian landscapes also present a fresh way to appreciate the shapes and dimensions of succulents.

To create such a fantasy, you will need a diminutive building, ideally one with Santa Fe, Spanish, or Old West architecture—because these are in keeping with the dry climates that the plants suggest. Fill the pot to 1 inch below the rim with a coarse, fast-draining cactus mix, and place the miniature building just off center. Next, scoop out some soil and add three treelike plants. These should be approximately three times the height of the container and should relate to the size of the building, in terms of scale and proportion, as real trees might.

When selecting plants, look for those with a variety of leaf shapes. If they are a mix of square, elongated, and oval, they will enhance the composition with texture and contrast. Repeat certain elements as well. For example, if the tiny building is a pink-terracotta color, one of your tree choices might be peach-colored *Euphorbia tirucalli* ‘Sticks on Fire’. Other branching, treelike succulents include most crassulas, particularly *Crassula ovata* ‘Gollum’ and *C. tetragona*. Tuck a tiny, spiky haworthia along one side of the structure; it will fill in the middle ground and suggest a giant agave.

Finish the miniature landscape by covering the soil around the building with decomposed granite, fine-textured gravel, or neutral-colored aquarium rock. You can also use it to create a pathway from the edge of the container to the door, to draw viewers into the scene.



This miniature landscape illustrates the “rule of three,” with three mini trees and three terracotta-colored elements. Foliage blends and swirls throughout the composition and partially conceals the focal point—the little mission. The pot is positioned so that a backdrop of blue *Senecio mandraliscae* contrasts with orange *Euphorbia tirucalli* ‘Sticks on Fire’. Design by owner Suzy Schaefer



Each pot in this cluster is different, yet all are unified by color. Star-shaped plants also provide an element of repetition. The red succulent between the two *Aeonium* 'Sunburst' rosettes is *Aloe macrum*. A glossy green hechtia is on the left, and tiny blue echeveria hybrids add texture and color contrast. Design by owner Patrick Anderson



These pedestals contain *Agave desmettiana*, *Oscularia deltoides*, and bright chartreuse *Sedum rupestre* 'Angelina'. Design by Landcraft Environments, Ltd., Mattituck, NY. Photo by Dency Kane

STYLE AND SIZE

One way to make a grouping of containers dynamic is to choose pots that have a design element in common—such as material, color, or shape. You might, for example, use pots that all have a cobalt blue glaze. Or choose pots that are identical in size and shape, each with a different-colored exterior.

Pots should be in proportion to the space they fill. Small containers are fine for an intimate balcony, but larger ones make a statement in your yard. Imagine, for example, a pathway lined with pots at regular intervals. If each is different—perhaps a mix of glazed, terracotta, tall, and shallow—the landscape will lack continuity. But if each is a 3-foot-tall urn that contains, say, a clump of *Aeonium canariense* or large green *Agave attenuata* rosettes, they will create a pleasing pattern that draws the viewer into the garden.



This assortment of solid-hued ceramic pots stands out against a bold-colored wall. Pots repeat the textural gloss of the tile, yet their cool colors contrast with yellow and orange. The cycad *Zamia furfuracea* is in the large green pot. Design by owner Ivette Soler, Eagle Rock, CA. Photo by Lisa Romerein



Dracaena draco contrasts with the smooth texture of stucco walls and a stone floor. Pot colors blend with surrounding sand hues yet also offer contrast in their round shapes. Even the tree's shadow subtly enhances the composition. Design by owner Suzy Schaefer

Large pots will look ungainly unless they contain proportionately large plants; tall and treelike succulents are obvious choices. When their roots are confined, large succulents grow slowly. Container-grown agaves stay much smaller than their garden-grown counterparts.

POT PLACEMENT

If your outdoor rooms have blank walls, use potted succulents or wreaths to fill empty spaces and elevate foliage to eye level. Half-pots with flat backs can be mounted on a wall and filled with cascading succulents, such as *Sedum morganianum*.



A wall-mounted pot serves as a welcoming bouquet for arriving guests. Along with the tile address plaque and rustic light fixture, the pot sets the stage for a garden with personality. Lending height to the arrangement is *Crassula tetragona*. Design by owner Anne Samstad



Senecio rowleyanus overflows its pot. Sherman Library and Gardens, Corona Del Mar, CA

nianum or *Graptopetalum paraguayense*. Cover an entire wall with plants in half-pots to create a lush, vertical garden that takes up little room. Hang succulent wreaths on fences or doors.

It often is better to use one large pot than several smaller ones—certainly, it is more dramatic and less cluttered. The rule of thumb is that the pot (or grouping) should fill a third or more of the display space. So if your patio wall is 8 feet high, use a pot—or a plant stand with a pot on top—with a combined height of 3 feet or more.

You can also hang baskets of succulents from an overhead beam. Ground covers, such as *Portulaca grandiflora*, lampranthus, and drosanthemums, make lovely additions to hanging baskets, as do cascading plants such as *Senecio rowleyanus* (string of pearls).

In sitting areas, enhance a sense of enclosure by elevating plants to tabletop-height. Eye level is the key; if the container is in an area that receives mostly foot



A wrought iron plant stand raises this bowl of *Sedum spathulifolium* 'Cape Blanco' to eye level. Roger's Gardens nursery, Corona Del Mar



A rat-tail cactus (*Aporocactus flagelliformis*) tumbles out of an overturned pot, suggesting a waterfall. Design by Rogue McNeal

traffic, for example, use succulents that grow tall, such as *Beaucarnea recurvata* (ponytail palm) or *Euphorbia trigona*. A succulent wreath or topiary makes an excellent centerpiece for the table.

CREATIVE DESIGN IDEAS

Window boxes, urns, shells, and even hollow concrete blocks can serve as containers that display succulents in creative and visually intriguing ways. Any object that is impervious to water, that will contain soil to a depth of several inches, and that has one or more drain holes has potential to serve as a container for succulents.





A hollow concrete block that holds a pot of *Kalanchoe blossfeldiana* contrasts with the flowers' fluffy texture. Design by owner Francesca Filanc



Aeonium 'Kiwi' grows in the window box of a playhouse in the children's garden at Quail Botanical Gardens. Design by Bill Teague

(top) A shell holds tightly packed *Sempervivum tectorum* cuttings. Photo by Catriona Tudor Erler

(bottom) Echeverias and flat *Aeonium tabuliforme* rosettes resemble water lilies in this lily pond composition. Blue and green glass pebbles enhance the illusion. Design by California Cactus Center nursery

ENTRY POTS

Your home's entry is an ideal location for potted succulents, because the plants will be enjoyed by visitors and passersby.



Atop pedestals flanking a front walkway are large terracotta pots containing *Agave angustifolia* var. *marginata*. *Agave vilmoriniana* grows along the wall. Companion plants include bougainvillea, *Anigozanthos* species, and in the foreground, Spanish lavender and blue fescue. Design by Russ Johnston and Denny Smithgall, SJA Inc.



Pots of ice plant lend color and character to a flight of stone steps at Rancho La Puerta, Tecate, Mexico



A large terracotta pot planted with *Aloe vanbalenii* makes a dramatic statement near a home's entrance. The downward curving leaves of the aloe hug the pot and repeat the rounded shape of its handles. Janice Byrne garden. Design by Bill Teague



In this entry garden, two tall *Euphorbia ingens* underplanted with blue *Senecio serpens* frame the front door. *Agave attenuata* fills the pot between the blue chairs. Design by owner Peggy Petitmermet



Aloe nobilis grows with echeverias in a simple terracotta pot. The ground cover at left is a variegated vinca.



Parodia magnifica in a terracotta pot. Design by California Cactus Center nursery

PLASTIC AND TERRACOTTA

If you are not sure what type of pot would be best, choose terracotta. Its neutral color blends with any setting and does not call attention to itself—a good thing, because pots are like picture frames: their purpose is to show off what is inside.

Anything plastic can strike a jarring note in a garden, perhaps because it is a manufactured material that comes in colors seldom seen in nature. If you do use plastic pots, look for those that closely resemble terracotta or cast concrete; you have to touch (or lift) them to tell the difference.

Clay or porcelain pots provide good protection from temperature extremes, which is important in hot climates, because roots of succulents grown in plastic pots in full sun may bake. One way to avoid this is by setting a pot within a pot—place a plastic nursery pot inside a slightly larger terracotta pot, for example.



This complex arrangement in a terracotta bowl includes *Aeonium arboreum* 'Zwartkop', cholla cactus, and *Sedum rubrotinctum*. Carpeting the background is *Senecio mandraliscae*. Design by owner Suzy Schaefer

This makes it easy to switch plants when they are done blooming: simply slip a new plant, still in its nursery pot, into the ornamental container. If the outer pot has no drain hole, make sure the inner pot is elevated so its bottom does not sit in water.

Terracotta pots fired at a low temperature (typical of those made in Mexico) are more porous, and when repeatedly soaked with water, they eventually crumble. Pots fired at a high temperature (such as those made in Italy) are harder and last much longer. Quality pots are usually more expensive to acquire, but the investment is worth it, as high-fired terracotta pots will look good and last for years.

GEOMETRIC ARRANGEMENTS

What could be simpler than arranging identical small succulents in rows in a square, shallow pot? Such geometric arrangements, which perfectly illustrate the design principle of repetition, are bold, sophisticated, and eye-catching. The key is to find the right pot; look for them at nurseries that sell bonsai supplies.



Echeverias in a square pot. Design by California Cactus Center nursery



Parodia leninghausii
(golden ball cactus). Design
by California Cactus Center
nursery



Aeonium 'Kiwi' and
Crassula muscosa. Design
by California Cactus Center
nursery

Six easy steps to potting succulent plants

1. Assemble your materials: plants in nursery pots (or cuttings that have callused), potting soil, and ornamental containers.
2. Place a small stone or a piece of broken pot over the hole in the bottom of the pot. This will prevent soil from washing out, without impeding drainage. Another option is to patch the hole with a piece of plastic window screen.
3. Fill the pot three-quarters full with potting mix. Mix in a small handful of timed-release fertilizer.
4. Make a hole in the potting mix for the plant's root ball, and then place the largest and tallest succulent in the center of the pot. The base of the plant and the top of the soil should be about 1 inch below the rim.
5. Cluster remaining plants or cuttings around the center plant, and then add potting mix to fill gaps.
6. Gently water the newly potted plants to wash soil off the leaves and settle the roots.

Repotting tips

Most succulents and cacti need repotting every three to five years. But just because a plant seems to have crowded its pot does not mean it is in need of a new one; check the pot's drain holes to see if they are massed with roots. If none are evident, the plant may not need to be repotted.

Never pull a cactus or succulent out of its container—you might break it off at the crown, severing it from its roots. Instead, turn the pot on its side and slide the plant out. If a plant is firmly lodged in a plastic nursery container, squeeze the pot to loosen the roots. If it is stuck in a clay pot, turn the whole thing upside down, and, as you cradle the plant with one hand, gently tap the edge of the pot on a solid surface (such as a countertop), to jar the root ball loose. Or push it from the bottom with a pencil through the drain hole.

When removing a spiny plant from its container, wear leather gloves and/or use kitchen tongs. You also may find it helpful to wrap folded newspaper or an old towel around the plant.

Prior to repotting, examine the roots and prune any that are broken or coiled.

SOIL, SUN, AND FERTILIZER

Bagged soils designated for cacti and succulents are lighter than other potting mixes and often contain lots of tiny white chunks of perlite; their purpose is to keep the soil fluffy and aerated. Perlite is also a soil extender—it takes up space without adding nutrients. Since bags of perlite are cheaper than bags of potting soil, an economical alternative is to buy each and mix them, using one part perlite to five parts potting soil. Or use pumice, which unlike perlite, will not float when the pot is watered.

Depending on your climate, you may want to lighten the mix even more. If, for example, your pots are exposed to a great deal of rainfall, humidity, and cool temperatures—which means the soil does not dry out and tends to stay wetter than a wrung-out sponge—add more pumice. To create a mix that retains water—which is desirable in hot, dry, desertlike climates—add sharp (coarse) sand to the mix.

Most succulents growing in the garden do not need fertilizer, but those in pots and wreaths will benefit from the addition of a timed-release fertilizer to the potting mix, to give them a head start. Alternatively, apply a cactus and succulent fertilizer according to package directions or use an all-purpose liquid fertilizer diluted to one-quarter strength, every six weeks during the growing season (generally, spring and summer) but not at all during the plants' dormancy (generally, autumn and winter).

WATER AND DRAINAGE

Because succulents have thick, fleshy leaves that store water, they do not need to be watered as often as, say, a rosebush. Moreover, the thicker and juicier a plant's leaves, the more likely it will be damaged by over-watering. A succulent's system simply is not designed to handle excess water.

Several factors determine when or how often to water potted succulents: the weather, the type of plant, the size of the pot, and how dry the soil is. Any pot exposed to rainfall will not need supplemental water during the rainy season, and the plant should be moved beneath an overhang if rainfall is excessive. In summer and autumn—when the humidity is low, temperatures are high, and rainfall nonexistent—most potted succulents appreciate regular water. In general, although succulents will tolerate a considerable amount of neglect, they should not be allowed to go dry for weeks on end.

Good drainage is essential to the health of all potted plants—and succulents, in particular, cannot tolerate having their roots sit in water. Drowned roots rot, and then the plant dies. Granted, some succulents are more tolerant of wet conditions than others, but when in doubt, err on the dry side. It is not necessary to create a gravel layer in the bottom of pots to enhance drainage. If your pots are not draining well, it may be because they are sitting on soggy garden soil. Elevating pots also discourages snails and slugs from hiding in the drain holes.



A terracotta pot sits on a cast iron trivet, which allows air to circulate and protects the wood deck. Design by owner Anne Samstad

Any container with succulents should have at least one drain hole in the bottom, and if it has several, so much the better. Avoid using pots that come with built-in saucers that hold water. Also watch out for pots with bottoms that are slightly convex, because water that puddles around the inner edge can cause roots to rot.

Aeoniums will rot when grown in soil that stays soggy for prolonged periods, but remarkably, their stems will root and grow indefinitely in water. I discovered this when I cut a half-dozen *Aeonium arboreum* stalks to make what I thought would be a short-lived bouquet. The stems and leaves looked fine at the end of the week, so as an experiment, I kept them in the (opaque) vase, adding water as it evaporated. After several months, the plants were fine and their stems were massed with roots.

WHEN AND HOW TO WATER

Small pots dry out more quickly than large ones, and tall pots dry out less rapidly than shallow ones. Press your finger into the soil; if it is dry to a depth of several inches, or one-quarter of its height, it is time to water. Another method is to push a wooden chopstick into the soil, to the bottom of the pot. Pull it out, and if the chopstick is damp and/or soil clings to it, water is unnecessary.

It is a challenge to water a succulent that has grown completely over the top of its pot. Submerge the pot to just above its rim in a tub or pail of water, and then let excess water drain. This also is a good way to water plants that have gone so dry that the soil is caked and hard. I have seen nursery owners submerge a newly potted plant quickly, as though baptizing it. This soaks and settles the soil and also cleans the leaves.

If your area has hard water, leaves that are splashed may become spotted as water evaporates and deposits minerals. This is particularly noticeable on dark succulents, such as *Aeonium arboreum* 'Zwartkop'. Remove the white splotches by gently wiping the leaves with a soft cloth soaked in distilled water.

Provide enough water so that it runs out the holes in the bottom of the pot, thereby flushing salts that have built up in the soil. If this is not possible because the pot is indoors and is too heavy to move to a sink or bathtub, set a saucer beneath the pot to catch drips. But do not let the water that drains out of the pot remain in the saucer. Blot the excess with paper towels.

If prolonged exposure to moisture may damage the floor or tabletop beneath your pots, elevate them to allow air circulation. One way to do this is with terracotta “feet” sold at nurseries; you will need three per pot.

CREATE A SUCCULENT WREATH OR TOPIARY

Most craft stores sell ready-to-plant wire forms for succulent wreaths. Topiary suppliers also stock them, along with three-dimensional wire forms that range from monkeys that can hang from tree limbs to cats with tails raised. Whether you make a succulent wreath or a topiary, the method is similar.

Begin by assembling your cuttings. You want small, lightweight florets, rather than branches so large they are out of proportion to the wire form or so heavy their weight will pull them out. Leaves should range from about an inch in diameter down to the size of a bean. Remove the lower leaves, leaving 1 to 2 inches of stem. Store the cuttings in a dry, shady place for a day or so to *callus* (form a thin tissue of cells over the cut end). Plant them within a week, before leaves start to shrivel.

The loveliest wreaths or topiaries often are the simplest, with just one or two types of succulents, but variety also is intriguing. You can combine anywhere from six to ten kinds of plants. One key to creating a pleasing mix is to choose those with colorful foliage—red, lavender-pink, and yellow, for example.

Good succulents for topiaries and wreaths include gray-green *Aeonium haworthii*, medium green *Crassula ovata* (jade), gray-green *Crassula perforata*, dark green and white-striped *Haworthia attenuata*, gray-lavender *Kalanchoe pumila*, feathery chartreuse *Sedum rupestre* ‘Angelina’, bright green *Sedum kimnachii*, celery green and white-webbed *Sempervivum arachnoideum*, medium green *Senecio rowleyanus* (string of pearls), and blue *Senecio serpens*.

To spice monochromatic wreaths, add contrasting plants at regular intervals or group them like a bow. These might be a jade with colorful leaves, yellow-and-green *Portulacaria afra* ‘Variegata’, bronze-red *Sedum x rubrotinctum*, or bright red *Crassula coccinea* ‘Campfire’.

When making a topiary, consider how different colors and textures of succulents might enhance or emphasize various part of the design. For example, the square pattern of a topiary turtle’s shell might be outlined in fine-leaved, magenta *Sedum spurium* ‘Dragon’s Blood’ or green, white, and pink *S. spurium*

This topiary handbag has a handle of rosea ice plant (*Drosanthemum floribundum*). Cuttings used include assorted crassulas, sedums, and echeverias. Design by Margee Rader, the Original Living Wreath, Bon-sall, CA





Succulents with colorful and contrasting leaves enhance a wreath. Design by Suzy Schaefer

‘Tricolor’. A dog’s ears and tail might be fluffy *S. acre*, which resembles green yarn.

If you plan to hang a wreath on a wall or door (rather than laying it flat on a tabletop or other surface), place mounding, low-growing sempervivums and echeverias on the inside bottom curve and along the top. This will help preserve the wreath’s shape, because those plants stay compact. If you use varieties that have an ever-lengthening habit, the center of the wreath will fill in and the top will elongate (unless of course you continually pinch the plants back). And because succulents grow toward the sun, it may be necessary to rotate the topiary or wreath every week or so.

Add succulents with leaves that pop off easily (such as *Sedum morganianum*) last, gently easing the stem into a hole you have made with a pencil or chopstick.



Professional topiary designer Margee Rader uses long-handled tweezers to insert cuttings into a form tightly packed with moss and wrapped with wire.

This orb under construction has a design outlined with *Crassula ovata*; Margee Rader will fill gaps with a tight mix of cuttings with colorful leaves.



Make a 12-inch wreath

Assemble these materials:

Twelve-inch-diameter wire wreath frame, available at floral supply shops and crafts stores.

Several yards of monofilament fishing line or copper wire.

One or two bags of sheet moss (the moss is peeled off trees in sheets). Sphagnum also can be used, but sheet moss has a fresh green color, fine texture, and creates a carpetlike mat.

Bucket of water for soaking moss.

Four to six cups sterile, dampened potting soil. (This is optional; succulents will grow in moss alone. I add soil to wreaths because it is easy to do, as wire wreath forms open like clamshells. It is much more difficult to get soil inside a wire topiary form. Succulents growing in moss alone will need more frequent watering and regular applications of fertilizer.) Buy a bag of cactus/succulent mix, or combine two cups peat moss, one cup perlite, and one teaspoon timed-release fertilizer pellets.

A pencil or chopstick for poking holes.

One hundred (or so) succulent cuttings. As you assemble them, arrange them according to size, color, texture, and shape, as you would add paint on a palette.

U-shaped florists' pins (optional). If you do not want to wait until cuttings are rooted before hanging the wreath, these pins will hold them in place.

After you have assembled your equipment, you can start building the wreath.

1. Open the wire wreath frame; you will have two sections that resemble a doughnut sliced lengthwise. Place the two halves on a waterproof work surface.
2. Soak the sheet moss in a bucket of water for several minutes. Squeeze several palm-sized pieces gently to remove excess moisture, and then overlap them along the half-frames' concave surfaces. Place the sheet moss so the green side faces outward.
3. Mound one of the moss-lined half-frames with soil, pressing and shaping it with the palm of your hand. If you are not using soil, pack the wire wreath frame tightly with moss.
4. Put the two halves back together. Secure them by wrapping the filled wreath frame with fishing line or copper wire, spaced at 1-inch intervals. When you are done, add a loop from which to hang the finished wreath.
5. Using a chopstick or pencil, poke holes an inch or two deep for each cutting. Space them so no gaps show or farther apart if you prefer a looser, lacier look. Secure cuttings with florists' pins, if desired. Otherwise, store the wreath flat for a few weeks out of full sun, to give cuttings time to root.

CARING FOR A WREATH OR TOPIARY

Wreaths should be watered lightly, daily at first after being newly planted. After the cuttings root, water twice weekly or as needed to keep the moss evenly moist but not soggy. Display the wreath on or against a flat surface, such as a stone wall, that will not be damaged by moisture.

A well-cared-for succulent wreath or moss-filled wire topiary will last for years. Keep the form neat by pinching off new growth. If the arrangement feels lightweight and/or is hard and dry, soak it in water. If you have an automatic irrigation system, you might want to extend a drip tube to the top of the wreath or topiary so it will receive water at the same time as the rest of your garden.

Feed the wreath or topiary several times during late spring and summer with a liquid fertilizer, per package directions. Once cuttings are rooted, keep the wreath or topiary in full sun, unless temperatures soar (90°F or more) and humidity is low. In this case, move the form into an area that is shaded during the hottest part of the day.

Most succulents bloom during late winter, spring, or summer. If you let the plants produce flower spikes, your topiary or wreath will be more colorful, but less tidy.

Margee Rader created this topiary beach ball for a display at the San Diego County Fair. Stripes are florets of blue-green echeverias and aeoniums, black *Aeonium arboreum* 'Zwartkop', and red *Crassula coccinea* 'Campfire'.





Chapter Five

Growing Succulents in Colder Climates

Agave parryi is one of the most cold hardy agaves.

It is possible to cultivate a succulent garden in less than ideal conditions, even in areas prone to freezing temperatures and rainy winters. Many cold-hardy succulents thrive in regions that experience prolonged, hard frosts.

When water freezes at 32°F (0°C), it expands, which can burst plant cell walls and turn them to mush. Those succulents that are frost-tolerant have salts in their cellular fluids that lower the temperature at which the fluid freezes, or they can handle the formation of ice within their cells.

Non-hardy succulents may survive freezing temperatures if their roots are unharmed. But unlike perennials that continually replenish their leaves, frost-burned succulents may appear shriveled and blackened for months—even years. If this destroys the symmetrical shape and beauty of the plant, there may little point in trying to salvage it.

The preferred temperature range for non-hardy succulents is 40° to 85°F, but many will tolerate temperatures into the low 30s and highs in excess of 100°F (when grown in semishade). Other ideal climate conditions include minimal rainfall (fewer than 20 inches per year) and low humidity (the drier, the better).

If you live where temperatures occasionally dip below 32°F, but hard frosts are rare, you may be able to cultivate tender succulents in the ground year-round—providing you cover the plants when frost threatens or grow them in your garden's warmer microclimates. A protected pocket can vary by several life-saving degrees from an exposed area.

UNDERSTANDING MICROCLIMATES

Because cold air is heavier than warm air, it flows downhill and pools in low spots. To identify these cold pockets in your garden, notice where ice crystals linger the longest after sunrise. Warm spots tend to be near boulders, structures, trees, hardscape, and asphalt, which absorb heat from the sun during the day and release it gradually at night.

Wind is a factor, too. Garden areas shielded by walls, hedges, or some other windbreak will be warmer than those out in the open. Locations exposed to northerly winds tend to be colder. But wind is not always a problem; air that moves is less of a threat than air that is still, because movement keeps cold air from settling around plants. Wind can make leaves more frost-resistant, because it has a drying effect, and drier leaves contain less water. Good air circulation also discourages pests and fungal diseases, to which succulents are prone in damp climates. Excessive wind will cause desiccation, however, and if you are sheltering your plants within a cold frame, in a greenhouse, or beneath a cover, wind may cause greater heat loss by cooling the air around the structure.

Your garden's warmest microclimate, and the best place to grow frost-tender succulents in winter, is likely a sunny, south-facing area—ideally a slope backed by a fence or retaining wall, protected by adjacent trees, and/or strewn with boulders.

HARD FROSTS AND WET WEATHER

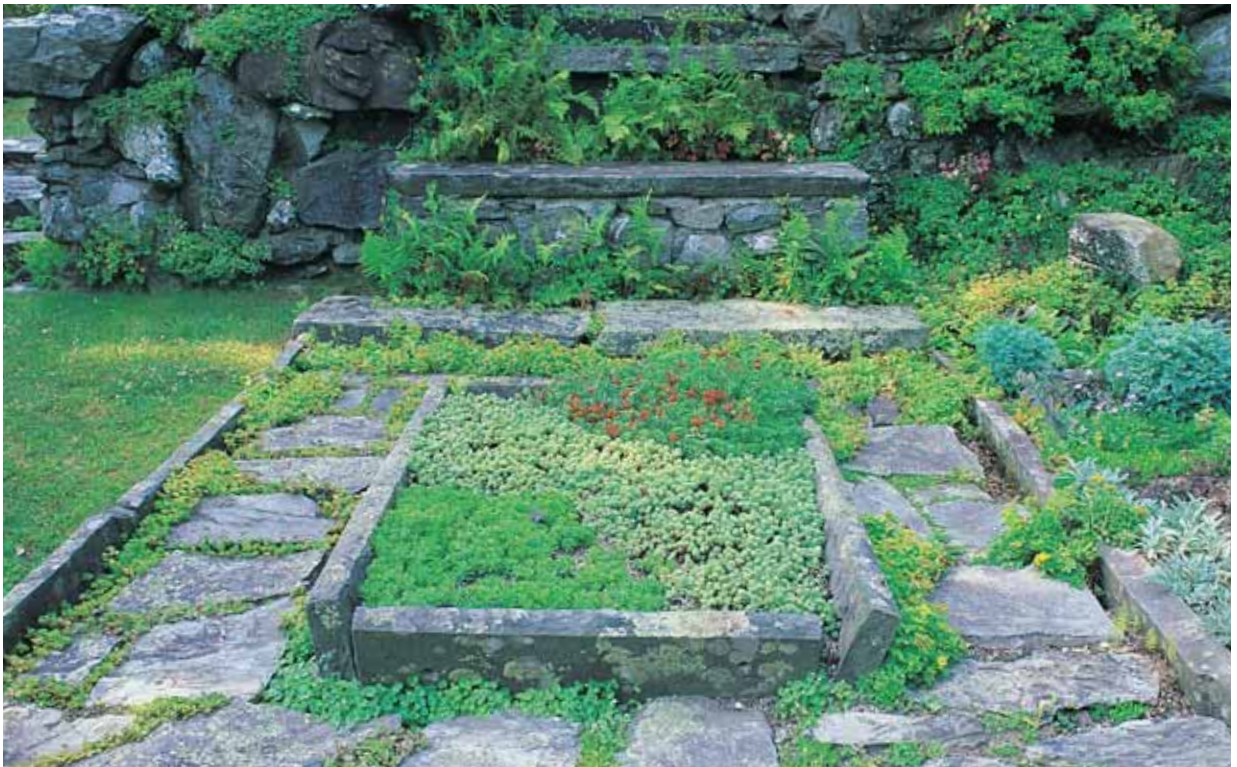
If you live in zone 8 or below, the tender succulents growing in your garden likely will have to be replaced from one year to the next or brought indoors in autumn. If your succulents are potted, this makes the job easy—especially if large specimens are on wheeled stands or you have a dolly handy. Be sure to check plants for insects, snails, and other pests you do not want to keep warm and snug all winter.

Another option is to take plant cuttings or divisions in autumn, root them indoors in pots or flats during the winter, and then introduce the young plants to your garden in spring. Small succulents also can be dug up—most can be uprooted easily—then potted and over-wintered as houseplants.

Regardless of where you live, one way to landscape your garden with non-hardy succulents is to grow them in nursery pots submerged in the soil up to the rims. As first frost approaches, lift the pots out of the ground and bring them inside—ideally into a place where the plants will spend the winter beneath timed fluorescent lights. Succulents also can be over-wintered in a greenhouse, providing it is well-ventilated and the humidity is low.

In spring, when you are ready to reintroduce the plants to the garden, acclimatize them gradually to outside temperatures and the sun's ultraviolet rays. Sunburn can cause permanent scarring, which is particularly a concern with

Sedums thrive year-round at Innisfree Garden in upstate New York. The raised bed enhances drainage. Photo by Dency Kane



succulents that are thin-skinned or variegated. The best time to introduce your potted succulents to the outdoors is during mild, cloudy weather. Place them in bright shade, leave them there a few days, and then move them into partial—and finally, full—sun. Cacti and succulents that do best in dappled shade during the summer in the Southwest may prefer full sun in northern states, but keep in mind that low-angled northern sun, at higher elevations, can be intense.

Excessive rainfall also is a concern. Succulents grown for prolonged periods in soggy soils will rot. Evaluate your soil for its ability to drain well, and note which areas of your garden are likely to stay drier. Plant on slopes or atop mounds of soil amended with decomposed granite or pumice, and avoid planting in depressions or basins in which water collects. Also, remove decaying leaves that collect in the crowns of succulents and on the surrounding ground. (It is not water that causes rot, but fungus or bacteria in organic matter.) Mulch only with gravel or fast-draining decomposed granite, and tent prized plants during rainstorms.

COPING WITH OCCASIONAL FROST

In my own garden (USDA climate zone 9), I cover vulnerable aeoniums, aloes, kalanchoes, and *Agave attenuata* with bed sheets on those clear, still, midwinter nights during which frost is predicted. Like my neighbors who own citrus and avocado groves, I watch the news or check the Internet daily from November through March to see if a “frost advisory” has been issued, which means temperatures will drop into the low 30s late at night and become progressively colder until daybreak.

When a frost advisory is in effect for your area, before going to bed, blanket vulnerable succulents with a lightweight fabric or burlap. Do not use plastic, because it traps moisture and intensifies the heat of the morning sun—a combination that can be more harmful than a light frost. Also avoid any material heavier than a bed sheet, especially when covering soft-leaved succulents; the weight of the fabric can break or crease leaves, causing permanent damage. Remove the fabric as soon as possible after sunrise so the plants can dry and trapped moisture can evaporate.

You can create a temporary canopy with tree branches, too. Push the cut ends of branches into the soil, so that the leaves arch up and over the plants you want to protect. Remove the branches if the weather turns wet, as they will hold moisture and drop decaying leaves.

Frost-tender succulents also can be protected with cold frames or floating row covers. With the latter, arched, flexible poles create a tunnel over the plants. This in turn is covered with a lightweight fabric (sold by the roll at garden centers), which is translucent and porous, allowing sunlight to shine through and

moisture to evaporate. Lay the material over the plants and secure the edges by weighing them with stones, bricks, or two-by-fours.

If the forecast is for light frost night after night (temperatures may dip below freezing, but only briefly), and you do not want to bother covering and uncovering plants repeatedly, skirt them with fabric for the duration. The temperature inside the screen will stay higher than that of the surrounding air by several degrees, which may be all that is needed. Place 1/4-inch-diameter wood dowels, metal rods, or bamboo or redwood plant stakes at least 18 inches tall (taller, if you are protecting a big plant) in the ground at 2-foot intervals. Use clothespins to attach fabric to the rods as you wrap it around them, forming a vertical screen. This will create somewhat of a windbreak, too, but obviously will not stand up to high winds. It also may not prevent frost from burning the tips of the leaves.

Winter weather that is most threatening to succulents is rain followed by frost, because plant cells are engorged with water. New growth is particularly vulnerable. Often—especially with aloes—the tips of pointed leaves freeze, but the rest of the plant is fine. These tips will remain dry and shriveled, which does not harm the plant but may compromise its appearance. Irrigate your tender succulents infrequently during the colder months to decrease their water content and increase the salt-to-water ratio of cellular fluid.

FROST INDICATORS

When winter temperatures begin to dip into the 30s, be vigilant. All it takes is a few hours below freezing to cause lasting damage to tender succulents. Take measures to protect your plants when these conditions are evident:

The air is still.

There is no cloud cover.

Stars glitter.

Humidity is low.

The moon is new or full.

The soil is dry and cold.

Daytime temperatures do not exceed 75°F.

An arctic air mass or cold front impacts the area.

The dew point (the temperature at which moisture in the air condenses into dew) is close to freezing.

How Thomas Hobbs over-winters his garden

Garden designer Thomas Hobbs of Vancouver, British Columbia, brings his garden's succulents indoors in October and replants them outdoors in March. This excerpt from *The Jewel Box Garden* (2004) offers his advice.

* * *

The trend of gardening with masses of non-hardy succulents is limited by the fear of winter. What do you do with them then? They are too beautiful to be considered disposable. All they need is bright light and an above-freezing windowsill to hang in there until spring. Lack of light in winter will result in stretched growth and very unattractive plants. Lower leaves will turn yellow, then papery and need constant removal. If you cannot provide a very bright location for winter storage of your succulents, give them to someone who can, or set up a grow light in the basement or an unused area. Keep the plants very close to the tubes if these are fluorescent, and watch for stretching.

Gardeners with hundreds of Echeverias (they multiply like rabbits!) stash them in plastic flats, not pots. At my house, I call this "Operation Echeveria Lift." Around Halloween, helpers from my nursery come with our big truck and we begin scooping them up with our bare hands. We place them tightly beside each other in plastic nursery flats and spend the next month cleaning them up. We check for insect grubs, slugs and rot, then group the plants by variety and place them, root ball and all, in flats. They spend the winter in semi-hibernation in a barely heated but bright greenhouse. They receive much less water (maybe once a week) and are allowed to rest.

Around March 1, I begin fertilizing again. A liquid feed of 20-20-20 at half my usual strength wakes them up. The increased light that spring brings really turns these plants on! Struggling specimens suddenly perk up and look happy. Once all danger of frost has passed, I place the flats of Echeverias out in the sun to "harden off" for a month or so. This direct sun brings out the subtle coloring and individuality of each variety. Then it is time to play!



Assorted echeverias and graptoverias in Hobbs's Vancouver garden. Photo by Allan Mandell

INDOOR CULTIVATION

Succulents least likely to survive frost tend to be those that adapt best to indoor culture. Unlike cold-tolerant succulents, non-hardy succulents do not require a hard frost as part of their natural cycle, and they thrive in the same conditions that make humans comfortable. A minimum 10-degree difference in temperature between day and night will encourage flowering.

Succulents grown as houseplants must have bright light. Position them beneath a skylight or near a window, making sure that sunlight magnified by window glass does not burn the leaves. Place pots a few feet away from the window, or cover the glass with a sheer curtain or translucent blind. Rotate the plants every few days, so they will grow upright. Succulents etiolate (lengthen and become spindly) as they stretch toward a light source, which compromises their geometric shapes.

Avoid placing potted succulents near indoor spas, humidifiers, or showers that generate a lot of steam. Plants that stay damp are prone to mildew, and minimal air circulation makes leaves a breeding ground for pests such as mealybugs. Cacti, in particular, need good air circulation; if possible, place them near windows that can be opened during the warmest hours of the day.

Succulents do nicely on a sun porch, and if it has a stone, tile, or brick floor that cannot be damaged by spilled soil or water, so much the better. But potted succulents grown indoors during their winter dormancy do not require much water—once a week, to moisten the soil, is plenty. Let them go dry, or nearly so, between waterings.

COLD-CLIMATE SUCCULENTS

More than 50 varieties of *Opuntia* and more than a dozen varieties of *Echinocereus* cacti will grow where temperatures drop below zero—according to members of the Ottawa Cactus Club, who have grown and tested them in their gardens. For example, *Mammillaria vivipara* (syn. *Coryphantha vivipara*), a globular rock garden plant with white spines and showy purple-pink flowers, is very hardy; it grows wild in Alberta, Canada, and as far south as Texas.

A few large succulents will tolerate temperatures to zero and below. Among them are *Yucca filamentosa*, *Y. flaccida*, *Y. glauca*, *Y. gloriosa*, *Y. harrimaniae*, and *Y. schottii*; and *Agave havardiana*, *A. lechuguilla*, *A. neomexicana*, *A. parryi*, *A. toumeyana*, and *A. utahensis*.

Aloe polyphylla, the only aloe that thrives in temperatures well below freezing, is one of the rarest. It is arguably the most beautiful aloe, because its green, triangular leaves form a flattened whorl that resembles a lavish bow. It is native to the high mountains of Lesotho, South Africa, and is in danger of extinction. It does not mind being buried beneath snow, but it must have exceptionally well-drained soil. *Aloe polyphylla* may never be common in the hot, dry Southwest, but

Aloe polyphylla

as it becomes more readily available, it likely will be a prized addition to gardens in colder climates.

Delosperma cooperi, an ice plant that produces magenta flowers and makes an excellent ground cover, is tolerant of both heat and cold and is hardy from zones 5 through 11. A yellow-blooming variety reputed to be even more cold-tolerant is *D. nubigenum*.

Lewisia cotyledon (zones 6 through 10) is an alpine wildflower native to the Northwest. The genus was named after its discoverer, explorer Meriwether Lewis. *Lewisia cotyledon* prefers full sun to part shade in warm climates and well-drained soil. Water minimally in winter or plants may rot. Lewisias belong to the Portulacaceae and like hot, dry summers. Plants produce daisylike white, pink, or apricot-yellow flowers atop 12-inch burgundy-red stems in spring and summer (year-round along the Pacific coast). *Lewisia cotyledon* sold in nurseries include white and pink ‘Siskiyou’ varieties, which are hardy to zone 3, and *L. rediviva*, which is hardy in zones 4 through 8.

Orostachys species are intriguing succulents for containers and rock gardens. Bright green rosettes about 2 inches in diameter elongate into tall, conical flower spikes in autumn. Plants are *monocarpic* (they die after flowering), but offsets take their place. Hardy to -32°F, they grow best in well-drained soil in partial shade.

Rhodiola often is lumped with *Sedum*, but the former is a separate genus that includes about 50 species of fleshy perennials with rhizomatous roots. Many rhodiola resemble large sedums and form masses of plants with multiple stems covered with slender, often toothed leaves. Individual star-shaped flowers bloom in cream, red, orange, or yellow. Most rhodiola originated in northern Europe, the



Pink *Lewisia cotyledon*

Orostachys species. Nancy Goodwin garden, Hillsborough, NC. Photo by Dency Kane





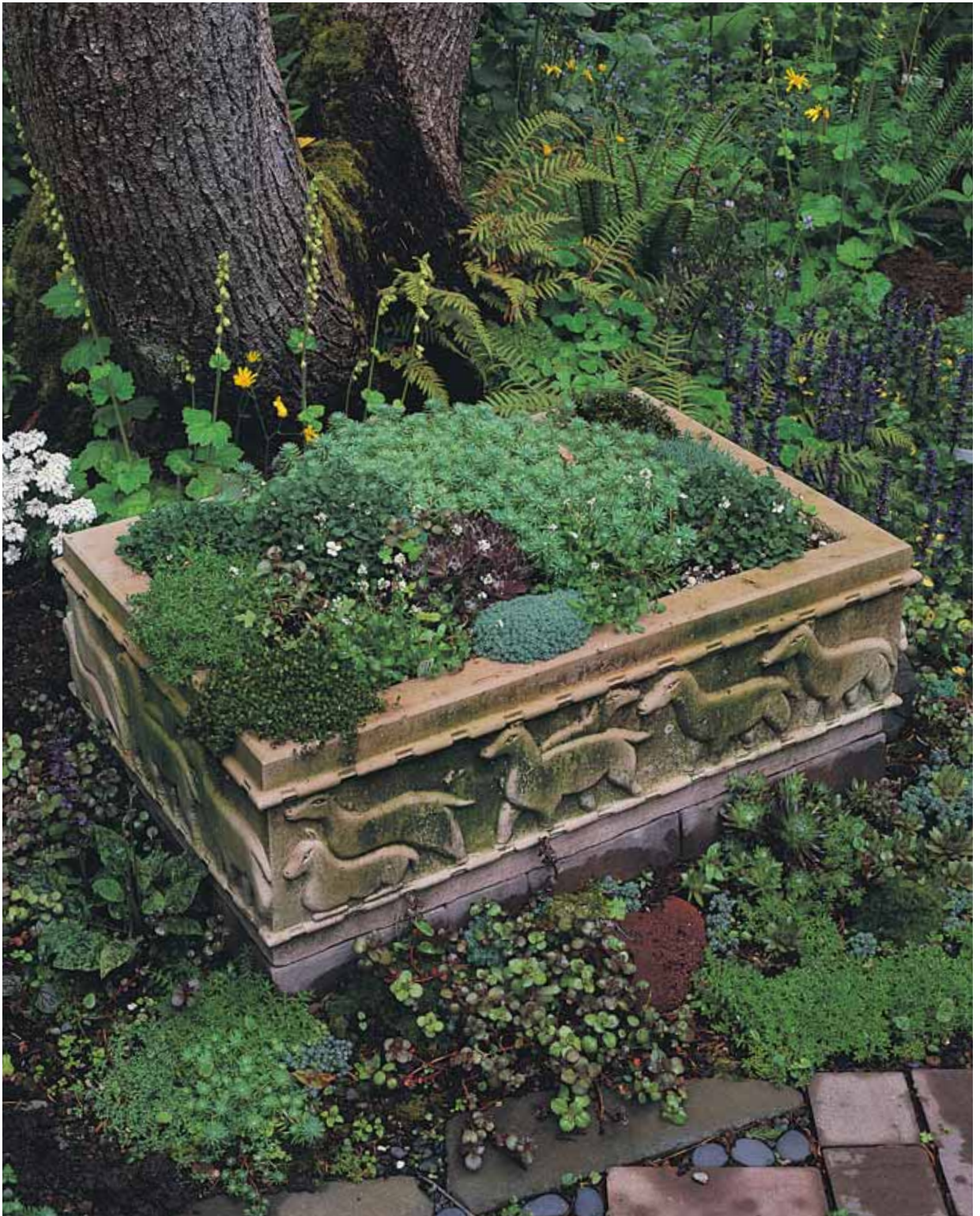
Sedum 'Autumn Joy' at Longwood Gardens in Kennett Square, Pennsylvania. Photo by Catriona Tudor Erler

Himalayas, Tibet, Afghanistan, Mongolia, or China and therefore thrive in colder parts of North America as well as Canada. (They most often are seen in Pennsylvania, New York, Maine, and Vermont.) Among the most common is roseroot (*R. rosea*, zones 2 through 9), which produces tightly massed pink flowers on 12-inch stems in summer. The roots smell like roses.

Sedum (stonecrop), though naturalized in the United States, is native to Europe. Widely cultivated sedums that are cold-tolerant and that, remarkably, will grow in most zones include the following fine-leaved ground covers (2 to 5 inches): *S. acre* (goldmoss sedum), which has light green leaves and clusters of yellow flowers; *S. album*, which spreads readily and can be invasive; and *S. anglicum*, which has dark green leaves a mere 1/8-inch long.

Shrublike sedums that grow to 18 inches tall, thrive in zones 5 through 10, and die to the ground in winter include *Sedum spectabile*, which has 3-inch-long blue-green leaves and domed flower clusters that come in a variety of colors; and

Sedums, sempervivums, and alpine plants combine to create the look of a needlepoint cushion. Ilga Jansons and Michael Dryfoos garden, Kenmore, WA. Photo by Allan Mandell





Sedum rupestre 'Angelina'



Sedum spurium 'Tricolor'

S. telephium, which resembles *S. spectabile* but has narrower, gray-green leaves. Both perennials die to the ground after flowering.

Sedum rupestre 'Angelina' (Angelina stonecrop) (zones 7 through 10), forms a frilly mat of chartreuse and golden yellow leaves that turn rust-red at the tips when stressed. Clusters of starry yellow flowers appear in summer. This versatile plant makes a great ground cover and is striking when massed. Use it to create rivers of color amid flowerbeds, as a border, and in juxtaposition with plants with deep red flowers and foliage. It is also lovely cascading from a container or tucked into a stone wall.

Sedum spurium is a ground-hugging succulent with dark green or bronzy leaves about an inch long; it spreads to 2 feet or more. In late summer, dome-shaped flower clusters appear and mature into pink flowers. *Sedum spurium* 'Dragon's Blood' has purple-bronze leaves and burgundy blooms; *S. spurium* 'Tricolor' is variegated green, cream, and rosy pink; and *S. spurium* 'Bronze Carpet' is a rich coppery green. All effectively add color to rock gardens, containers, and patterned plantings.

Sempervivum, or houseleek, is perhaps the best-known genus of the frost-tolerant succulents. The plants commonly are called hen and chicks, because small offsets nestle around the mother plant. They are attached by slender stems; once the little plants root, they become independent. *Sempervivum arachnoideum* (commonly called cobweb houseleek, zones 5 through 10) has pointed leaf tips webbed with white threads. These catch dew during spells of drought to keep the plant hydrated.

Sempervivum is related to *Jovibarba*, a genus that looks similar but has bell-shaped, pale yellow flowers. Cultivation requirements are the same, except *Jovibarba* is less tolerant of prolonged wet conditions. *Jovibarba hirta* (also known in the nursery trade as *Sempervivum hirta*) and *J. sobolifera* (*S. sobolifera*) are native to the Soviet Union and are exceptionally cold-tolerant.



*Sempervivum
arachnoideum*

This garden bed (about 6 square feet) is thickly carpeted with sedums, sempervivums, and jovi-barba. The fine-leaved gray ground cover is *Raoulia australis*. Design by Marietta and Ernie O'Byrne, Northwest Garden Nursery, Eugene, OR. Photo by Allan Mandell





Chapter Six

Plant Care and Propagation



Instead of trying to slide an *Agave guiengola* out of its nursery pot—which might have broken the top of the plant away from its roots—landscapers sliced open the pot with an ax. The next step is to spread and prune the plant's coiled roots.

Succulent gardens require much less care than lawns, flowerbeds, and pruned hedges. However, all plants are living things and change over time. As your garden's artistic director, you have the job—and, hopefully, pleasure—to make sure those changes happen when, where, and how you want them.

Keep your garden looking good year-round with minimal effort with the following practical methods for planting and grooming, controlling weeds and pests, and propagating plants.

IN-GROUND PLANTING TIPS

Prior to planting, spade compacted soil to loosen it, so roots will penetrate easily. When transplanting a succulent from its nursery pot, dig a hole deep enough to cover its roots, once they have been freed from the pot and untangled. Elevate the crown slightly to compensate for sinking later on. As soon as the plant is situated, tamp the dirt around its base, and then water well to settle the roots. (If a succulent has yet to establish roots or is dormant, withhold water for several weeks to prevent rotting.)

When planting nursery flats of succulent ground covers, use a trowel to dig holes several inches deep and about a foot apart. Separate the plants, insert one into each hole, and press the loose soil gently around the roots to anchor them.

Succulents that are large (several feet high and equally wide) can be surprisingly heavy. Lifting and moving them is a two-person job, even with the help of a dolly or wheeled cart. When working with any large spiny or prickly plant, wear elbow-length leather gloves and eye protection. Professional landscapers, when transporting “armed and dangerous” succulents, wrap them in carpet remnants—which protects the plants as well as the people.

When planting a small cactus, wrap it with a towel folded so that you can lift the plant with the ends, or simply hold it with kitchen tongs. Basketball-sized spherical cacti, such as golden barrels (*Echinocactus grusonii*), can be moved by rolling them onto a beach towel, which serves as a sling. Larger cacti, though highly desirable, are much more challenging to relocate. The safest and most efficient way is to carry the plant on a stretcher—not the kind used to transport injured people, but one constructed of rigid boards that can support the plant's weight. Though it takes two to lift it, a stretcher is better than a wheelbarrow,

because it can be placed on the ground next to the plant, which is rolled onto it. To lift a large cactus, lasso it with a rope thick enough (at least an inch in diameter) not to cut the plant's flesh. When the plant is in position, use the rope to hold it while a helper fills in the soil in the planting hole beneath it. Give newly transplanted cacti four to six weeks to settle in before watering them.

WEED CONTROL

Spring brings abundant growth. Plants that have been dormant all winter produce new leaves, flowers, and eventually seeds. Unfortunately, when garden plants are at their most lush, so are weeds. What begins as a few green sprouts ends up a dense thicket that rapidly goes to seed to ensure its survival the following year. In a succulent garden, yanking weeds means working around thorny aloes and agaves, disturbing shallow-rooted sempervivums, and accidentally popping the leaves off graptopetalums. But weeds must be removed; they compromise the beauty of the garden and rob prized plants of sunlight, water, and nutrients.

Weeds tend to be more of a problem wherever soil is exposed, because seeds need sun to germinate. Succulent ground covers work well to keep weeds under control, but they take time to fill in. Until they do, the best way to deprive weed seeds of sunlight is to mulch bare ground. You can do this with shredded bark, pebbles, gravel, or decomposed granite—whatever looks natural and is best suited to your climate and terrain. (Bear in mind that organic mulches generally are not the best choice for cacti and succulents.) Those few weeds that sprout in mulch are easy to pull, because their roots are not cemented into hard soil.

I do not have much of a weed problem in my half-acre garden, even in exposed areas and dirt pathways, because I deal with weeds six months before they sprout. I sprinkle a powdered preemergent herbicide (which prevents seeds from germinating) on any bare spots, including pathways. This is one of the few garden chemicals that I find essential. I buy a 25-pound sack of preemergent from a nursery or agricultural supplier in December—earlier, if rain is forecast—and spread it wherever I do not want to pull weeds, come spring. The downside is that no seeds from desirable plants will germinate in those areas, but I believe that is a small sacrifice.

What should you do if you have not spread preemergent herbicide, and spring is fast approaching? Be vigilant, and hoe the soil as soon as you see uninvited slivers of green. At that point, weeds are young, tender, and lightly rooted. In areas where a hoe is too large, you can disturb the soil with a trowel or even a steel file or spackling knife. This may seem tedious, but the larger a weed gets, the more difficult it will be to remove.

If weeds are growing amid cactus or other spiny plants, and it is impossible to pull those weeds without injuring yourself, use a long, slender brush to paint as many weed leaves as you can reach with glyphosate (one commercial brand

is Roundup). Do not spray the herbicide if some may land on your prized plants. Contrary to wishful thinking, glyphosate does indeed harm succulents and cacti.

If weeds have gotten away from you, and the task of eliminating them seems overwhelming, at least do the minimum: Remove any flower buds or seed heads. This is more important than uprooting the plant, which you can do later or simply let it die at the end of its annual growth cycle. (In fact, if erosion is a concern, roots of annual weeds should be left in the soil.) The urgent need is to prevent weeds from setting seed, because once they do, you will have to contend with their numerous offspring the following year.

Be sure to bag all weeds and send them out with the trash. Do not leave them lying on the ground or add them to your compost pile.

GROOMING YOUR PLANTS

Remove any dirt and leaves that have fallen onto the crowns of rosette succulents to keep them tidy and prevent moisture accumulation that may cause tissue damage. An occasional blast with the jet setting of a pistol sprayer works nicely. If rainfall is minimal in your area, hose down all your succulents from time to time; a good cleaning will diminish pests as well as dust.

Aloes, aeoniums, agaves, yuccas, and other succulents send up long-lasting bloom spikes that are a joy to behold, but eventually they become unsightly as the blooms fade. When deadheading, cut the stalk where it emerges from the plant. Of course, the entire plant also will need to be removed if it dies after flowering. A few succulents, particularly senecios, have insignificant blooms that, to me, look messy and should be removed. On the other hand, two that delight me are snipped and discarded by other gardeners: the minaret-like spires that elongate *Kalanchoe luciae* and *Crassula coccinea* ‘Campfire’. These stretch the plants and eventually ruin them—but not if you sever the budding stems as they form. (This does not work with monocarpic plants such as agaves and aeoniums; once the plants gear up for flowering, they die regardless.)

Aeonium trunks tend to look a bit naked when they reach 12 inches high or more. Snap off the rosettes several inches below the foliage, allow the cuttings to callus, and then replant; they will root readily. Either uproot and discard the gangly trunks, or wait to see if they resprout multiple branches—they often do, but not always.

If agaves are growing near a path or anywhere their sharp terminal spines might pose a danger, you can snip the thorny tips (about ¼ inch) off the leaves without detracting from the symmetry of the plant. Should you need to remove an agave leaf that is damaged or encroaching on a walkway, cut it off as close to the trunk as possible. Try to avoid partially removing a leaf from any succulent; the blunted end will call attention to itself and diminish the beauty of the plant.

Some succulents, notably aloes, have lower leaves that curve downward, remaining on their stems. These dry leaves provide protection from sunburn and frost, so if those are concerns, keep the leaves; otherwise, if you find them unsightly, peel them away.

Watch for pups that sprout near aloes and agaves. Remove them if they encroach where they are not wanted, and replant them where they are.

HAIL AND SNAILS

Two of the most damaging things that can befall succulents growing out in the open happen to rhyme. There is nothing you can do about hail, unfortunately, because it is sudden and unpredictable. In a matter of seconds, it pockmarks succulent leaves—soft-leaved agaves are particularly susceptible—giving them a freckled look. These blemishes do not go away, and since leaves on succulents can persist for several years, hail damage is truly unfortunate.

Snails cause long-lasting and unsightly damage, too—sometimes latching onto a leaf and eating a hole right through it. Or they will eat their way across a leaf, leaving a scar. When they nibble black *Aeonium arboreum* ‘Zwartkop’, it looks sadly frayed, its exposed tissue white against the dark foliage. To tidy a snail-bitten aeonium, remove damaged leaves by pinching them where they join the stem.

Snails are insidious. During the day, they sleep in leaf litter or on the undersides of leaves. At night and on drizzly days, they emerge to eat their fill. Of the several snail solutions, none is ideal. You can hand-pick them, but this means extreme vigilance, or their population will explode before you know it. You may not think you have a snail problem in March, but by mid-April, you will find them everywhere. So start early, and look for young ones. By the time they are as big as your thumbnail, they are large enough to lay eggs. I simply step on them, but if you are squeamish, don latex gloves, gather snails in a trash bag, and tightly tie the top.

Another approach is to spread a granular poison that kills snails. This is a concern if you have pets, and even “pet-safe” brands may harm songbirds and beneficial insects. Moreover, snail bait is expensive, and it has to be reapplied continually. Do not assume you can spread snail bait once in April and the job is done. Four to six weeks later, the snails will resurge, and you will be back at the store, buying more.



A brown helix snail exits the scene of the crime.

I do not recommend using barriers to keep snails out, except copper bands on tree trunks; nor do I advocate placing shallow bowls of beer in the garden. However, if you provide snails with a dark, damp, cavelike shelter—such as an overturned clay pot—they will go into it. This is satisfying, until you realize the dozen or so in the pot represent a tiny percent of your garden's population. Geese eat snails, but I figure a large bird in my garden would cause more problems than it solves.

What works best for me is, I regret to say, not an option for everyone. I release beneficial decollate snails throughout my garden (about one decollate snail per square foot). They do not nibble the leaves of healthy plants but rather feed on decaying matter, and—more importantly—the eggs and young of brown helix snails. Decollates have conical shells and are about an inch long. They are not inexpensive, but in the long run, they cost less than snail bait. They also are a natural rather than a chemical solution. The downside is that it takes a while for decollates to get established, during which time helix snails continue to do irreversible damage. Moreover, you still have to hand-pick mature helix snails; the alternative is to wait for them to die a natural death.

Six weeks before releasing decollate snails, reduce the helix snail population by spreading snail bait. Never spread snail bait once you have introduced decollates. I reintroduce decollates during every winter rainy season, because their population seems to wane—perhaps they have been preyed upon by birds or rodents, or they move on. Helix snails, on the other hand, need no assistance reintroducing themselves.

Decollates are approved in some parts of the country, but not in others, for fear they will disrupt the ecological balance. Not that much seems to be in balance any more; helix snails, for example, are not native. Their origin is shrouded in the murk of history, but one theory is that they were introduced as a potential food source. Indeed, that is the only control measure I have yet to try.

HARMFUL INSECTS

Just when I have led you to the conclusion that the only answer to keeping your succulents beautiful is to grow them indoors, let me caution you about mealybugs and scale. Plants that do not receive good air circulation and that grow in a humid environment are prone to sucking insects. Succulents in the garden also attract aphids or thrips when flowering buds are young and tender.

Mealybugs look like bits of cotton fluff; scale are hard, oval brown bumps; and aphids and thrips are pinhead-sized, soft-bodied insects that chew and destroy new tissue. Mealybugs usually can be spotted in leaf axils, but they sometimes attach themselves to roots. Scale, on the other hand, tends to latch onto stems and the underside of leaves. Plants with a severe mealybug or scale infestation should be destroyed, lest the pests spread to healthy plants. Discard the soil and wash the pot thoroughly before reusing it.

Insecticides can be sprayed on mealybugs, thrips, scale, and other pesky insects, but I simply use rubbing alcohol instead. I keep it handy in a spray bottle, ready to go at the first sign of a problem. A fine, light spray of alcohol does no damage to succulent leaves and kills the bugs instantly.

Aloes are prone to aloe mite, a microscopic insect that causes tissues near the stem to grow lumpy and distorted. Unfortunately, no cure is known, and affected plants or portions thereof must be removed and destroyed to prevent infestation of neighboring plants. Any tools that may have touched diseased tissue must be cleaned and disinfected.

If your succulents are damaged by rot, you can try to salvage the plant by cutting out the damaged area and replanting the healthy tissue. During a record wet winter in my garden, the roots of a handsome clump of *Aeonium* 'Sunburst' succumbed to rot. At first, the tops of the plants seemed fine, but the florets gradually shrank in size, until what was a lush mini-forest looked wan and spindly. When I pressed the stems, they were firm at the top and soft at the bottom. I pulled the entire clump from the soil, discarded the decayed tissue, and cut the stems to salvage the florets, retaining several firm, healthy inches. The cuttings since have rooted and are thriving.



Cotyledon buds, damaged by aphids, may not open.



This unsightly, cancerous growth is caused by aloe mite.

PROPAGATION

The majority of succulents are winter-dormant, so the best time to propagate them is in spring, as they begin their active growth cycle and before summer heat intensifies. Autumn is the best time to start summer-dormant succulents, such as aeoniums, haworthias, sempervivums, and senecios.

Get new plants off to a good start in pots or flats. Any commercial cactus mix will do, but you can make your own. The Huntington Botanical Gardens formula is two parts forest humus, two parts pumice, one part builders' sand, plus trace amounts of superphosphate and cottonseed meal.

Place pots and flats in a warm, sheltered nursery area of your garden that receives bright light but no full sun during the hottest part of the day. When young plants are well rooted, you can transplant them into the garden. Once in the ground, for the first week or so, they should be protected from harsh sun; shade them with empty nursery flats or dry, twiggy tree branches. Or simply move a piece of garden furniture so it is between plants and sun at midday. Mulch with gravel to help cool the soil surface and slow evaporation.

At the base of the slender, gel-filled leaves of *Bulbine frutescens* is a stem along which grow spaghetti-shaped tuberous roots. These are either in the ground, partially exposed, or entirely exposed, depending on how friable and moist the soil is. (If the ground is dry and hard, the plant's runners tend to be more accessible.) To propagate *B. frutescens*, dig a trench several inches deep and a foot or so long. Lay one or two rhizomatous stems into it and cover with soil, with leaves exposed.

Propagation in commercial nurseries and at botanical gardens takes place in temperature-controlled greenhouses, beneath fixtures that provide artificial sunlight. Professionals also have methods of collecting, labeling, storing, and germinating seeds, and they follow prescribed schedules for repotting plants in



Bulbine frutescens roots

successively larger containers. Since most of this is beyond what home gardeners are willing or able to do, the methods described here are most useful for the novice.

Keep in mind that perhaps more than any other type of plant, succulents are easy to propagate. More often than not, if you study the plant, how it reproduces will become obvious.

CUTTINGS

Propagation by cuttings is a process that needs no special skill or tools. If you have started geraniums from cuttings, you know how to propagate succulents with stems. Cleanly cut several inches of stem with leaves attached, using garden shears, scissors, or a sharp knife. The stem should have at least two nodes (the thickened area where leaves emerge): one to produce roots, the other for leaves. Because the cut end is raw and open, give it several days to heal—the tissue that forms over the end is called *callus*. Although some books recommend dipping stems into sulphur to discourage fungus or in rooting hormone to promote cellular growth, I do not bother.

If you delay planting the cuttings, after a week or so, roots may grow anyway—into thin air. Succulents are able to reverse the flow of growth, sending nutrients from stems and leaves into root formation. As this happens, leaves will shrivel, but as soon as new roots take hold, leaves will plump and the plant will thrive.

Some succulents, notably *Aeonium haworthii*, form whiskery aerial roots along the undersides of stems. These are attempting to connect with the soil, so all you have to do is help them. Dig a shallow trench and lay the stem in it, root-side down; then cover with dirt.

Fat-leaved graptopetalums, pachyphytums, and some non-hybrid echeverias will form roots and even tiny new plants at the base of dropped leaves. To encourage this, rest the leaf, stem-end down, atop potting soil. Keep soil moist but not soggy; mother leaves and their offspring tend to rot easily.

Remember that when handling cuttings from euphorbias, you should wear gloves and eye protection; the milky sap is caustic.

DIVISION

Uprooting (or unpotting) an overgrown clump and pulling the stems and roots apart is called *division*. Sometimes roots are so dense and tangled they have to be sawn apart—which often is the case with overgrown sansevierias.

Divide offsets by cutting or wiggling them loose from the parent, and then peel away any old, dry leaves. When you plant the offspring, space them so they will have room to reproduce on their own.

Rhizomes are fleshy underground roots from which new plants sprout. These *pups* are a bonus if you want them and a nuisance if you do not. In any case, propagation is easy: simply dig up the new plant, and it is ready to replant else-

where. *Agave americana* launches vigorous rhizomes laterally under the soil, which soon results in a cluster of smaller pups nestled at its base. I have seen *A. americana* pups pop up several feet from the mother plant, which seems to look demurely the other way, as though to say, “Those are not mine!”

I made the mistake of planting *Aloe saponaria* in my succulent tapestry, which has a geometric arrangement. Now that the succulents in the tapestry have filled in, I do very little weeding, except to remove *A. saponaria* pups growing where I do not want them. The soil in the bed is loose and sandy, so I grab the pup firmly at its base and lift up. This exposes a rhizome about 1/2-inch thick, which, like an umbilical cord, connects the young plant to its mother. I cut the rhizome at the base of the parent plant and discard the offspring.

BULBILS AND PLANTLETS

Bulbils are tiny plants that grow along bloom spikes. Perhaps the most dramatic examples are agaves and furcraeas that literally pump their life force into tall, multi-flowered stalks. After each flower drops its petals, its base (ovary) swells



These *Agave americana* ‘Marginata’ plants are young, but their rhizomatous roots have already spawned pups.



Plantlets grow along the edges of a bryophyllum.



Expert Marylyn Henderson beheads a ruffled echeveria.



A beheaded echeveria has sprouted roots and is ready to be planted.

and produces leaves, creating one of many tiny replicas of the mother. The parent plant's demise continues to help the propagation process; when it collapses and the flower spike falls, it propels hundreds of young plants onto the ground.

Some smaller succulents, such as *Haworthia attenuata* and ground cover *Crassula multicava*, also produce new plants on the tips of flower spikes. When this slender stalk gets heavy, it lowers its burden to the soil, where the young plant—which by then may have sprouted roots—takes hold.

Kalanchoes in the *Bryophyllum* genus form *plantlets* along their scalloped leaf margins, giving them a ruffled look; these drop by the dozens and take root. Some gardeners consider such abundance a nuisance, and indeed it can be. On the plus side, if these young plants are allowed to mature, they produce lovely parasols of bell-shaped flowers.

BEHEADING

Leggy aeoniums and showy hybrid echeverias—those that resemble ruffled cabbages—are best propagated by having their “heads” cut off. This sounds drastic, but it is easy to do and rewarding. As the plant grows, its stem elongates, which is not as attractive as a tight rosette with no stem showing. When you tire of looking at the ungainly stem, remove any shriveled leaves from the base of the rosette. With a sharp knife, slice horizontally through the stem, severing the rosette about an inch below its base. Place the rosette in a sheltered, shady area, ideally upright with its bottom leaves resting atop an empty pot. In ten days or so, the cut end will have callused and sprouted roots. Pot it in fresh soil.

Do not discard the original plant's decapitated stem. Keep it in its pot and tend it as when it was intact. New rosettes may grow from one or more leaf axils. When these are 2 or 3 inches in diameter, remove and plant them.



Aloe cameronii blooms at right, with *Portulacaria afra* 'Variegata', *Echinocactus grusonii* (golden barrel cacti), and blue *Senecio serpens*. *Aloe elgonica* is at upper left.
Jeff Moore garden



Part Two

Plant Palette



Chapter Seven

Tall, Treelike, and Immense Succulents

Large succulents border a lawn and serve as a backdrop for smaller specimens. On the left is a *Dracaena draco* tree in bloom; behind it is *Aloe barberae*. Abby Sher garden (Modelo Shales), Pacific Palisades, CA. Photo by Deidra Walpole

Large succulents are useful as backdrops and garden focal points. When mature, most are able to store enough water in their tissues to survive on rainfall alone.

A solo dasyliirion, with its fountainlike spray of slender leaves, or an agave the size of a Volkswagen, may serve as the perfect enhancement for a sunny garden corner—indeed, because of their dramatic sculptural shapes, they may be the only plants needed. Because succulents such as these are impossible to prune without damaging their superb geometry, and because they have sharp tips, do not plant them within 6 feet of a pathway, stairway, sidewalk, or driveway.

Whether columnar or branching, succulent trees balance a landscape's overall composition and add important vertical interest. Position them where their silhouettes will show to advantage against the sky or an uncomplicated backdrop, such as a blank expanse of wall, a stone terrace, or a large boulder. Unless your intent is to create a geometric arrangement, avoid aligning them like telephone poles.

Large succulents also offer practical advantages. During hot, dry weather, they protect soft-leaved understory plants from excessive sun; in winter, they radiate warmth. They also create less leaf litter than deciduous trees, which means a tidier garden and less likelihood that organic matter will fall into rosette-shaped succulents and cause them to rot.

Agave

Agave americana (10 to 15 feet tall and as wide) is commonly called century plant, because it seems to take a century to bloom (though it actually flowers after a decade or so). The plant's long, tapered, blue-green leaves are 6 to 10 inches wide, grow to 6 feet long, and are tough and leathery, with hooked prickles along the edges and sharp pointed tips. Pups enlarge the plants' domain indefinitely.

Agave americana and its hybrids are native to Mexico and are also found from the Southwest to Florida. Flower spikes that rise to 20 feet are massed with upright yellow blooms on branched stems. Like all agaves, *A. americana* dies after flowering, and because plants become immense, they can be difficult to remove. When positioning any large agave, bear in mind you will eventually contend with deflated, thorny foliage and a flower spike the size of a sailboat mast. Fortunately, only the flowering rosette dies; the pups remain to carry on.

The best thing about *Agave americana* is that it thrives with no care at all. Like cactus, it handles drought like a dromedary. It also does not mind frost, blazing sun, or poor soil. It makes an excellent filler for slopes where nothing else will grow and for any area that receives little or no irrigation. The downside is that this large agave is the alligator of the plant world—cute when small; aggressive, sharp-toothed, and unmanageably large when mature. Plant *A. americana* where it will have plenty of room and where it will not encroach on sidewalks, roadways, street signs, mailboxes, stairways, or children's play areas. The plant is definitely not kid-friendly. For safety's sake, snip off its needlelike leaf tips with garden shears.



Agave americana with *Festuca glauca* (blue fescue).
Design by owner Peter Bailey



Agave americana 'Marginata'

Because it forms a fanlike mass of pointed leaves, *Agave americana* makes a striking backdrop for smaller succulents, such as aeoniums, which produce conical yellow blooms that contrast beautifully with the agave's silvery blue. *Agave americana* is also gorgeous when combined with plants with bright red flowers, such as bougainvillea, *Crassula falcata*, or *Euphorbia milii*. For a pleasing textural contrast, juxtapose *A. americana* with a plant that seems ethereal compared to its sharklike presence—for example, an angel's trumpet tree (*Brugmansia*) or dainty Santa Barbara daisies (*Erigeron karvinskianus*). Consider monochromatic combinations, too, such as a ground cover of blue *Senecio serpens* or blue *Festuca glauca*.

Variegated forms of *Agave americana*, with leaves that resemble broad, striped ribbons, are the showiest of succulents. 'Mediopicta' has a yellow stripe down the middle and blue-green edges; 'Marginata' (also known as 'Aureomarginata' and 'Variegata') is blue-green in the middle with yellow leaf margins. Although these share many traits with their blue-gray cousins—including a tendency to offset with abandon—they tend not to grow as large, or as vigorously. They are, however, slightly more frost-tender.



Agave franzosinii at
Mission San Juan
Capistrano, California.

As *Agave americana* grows, its leaves become so heavy, they bend and curve downward. If you prefer a crisp, fanlike silhouette rather than the looser look of floppy, undulating leaves, *A. americana* 'Selecta' appears identical to *A. americana* when small, but as it grows, its leaves stay upright. It, too, has blue and variegated forms.

Another immense agave, sometimes mistaken for *Agave americana*, is *A. franzosinii* (to 8 feet tall and as wide as 14 feet). Unlike *A. americana*, *A. franzosinii* leaves are more concave, with the edges curving upward and inward, creating a long gutter that tapers to the tip. It is also lighter in color—a striking powdery blue.

Agave guiengola (to 4 feet tall and 6 feet wide) is considered by some collectors to be the most spectacular large agave because of its silvery color and sculptural form. Its leaves are lighter in color than those of *A. americana*, and though serrated along the edges, they are not as wickedly fanged. Leaves also are much wider and thicker than those of *A. americana*. It pups infrequently.

Beschorneria, an agave relative from Mexico, is seen infrequently in cultivation, but that is changing due to a surging demand. The flowering spike of *B. yuccoides*—which lasts for months on end—is among the most dramatic of any plant. In spring, a tall (to 6 feet), arching, and branching stem emerges from a gray-

green rosette, 2 to 3 feet in diameter, that looks like a cross between a yucca and an agave. Both stem and branches are bright coral-pink. Flowers aligned along the branches are chartreuse and bell-shaped, held in yellow bracts. Unlike agaves, *Beschorneria*s do not die after flowering. In frost-prone areas, position the plants against warm walls. In hottest climates, provide partial shade. *Beschorneria* is not fussy about soil, but it requires regular water and good drainage. A variegated variety of *B. yuccoides* exists but is rare.

Also in the Agavaceae and native to northern Mexico is *Hesperaloe*, often mistaken for a yucca because of its stiff, strappy foliage. The most popular species, *H. parviflora*, is commonly called red yucca. It has become a popular landscape plant throughout the desert Southwest because of its drought tolerance, ease of care, and showy red flower stalks that bloom all summer long. *Hesperaloe parviflora* forms 2- to 3-foot rounded clumps of bladelike foliage; leaves have curly white filaments along their margins. Varieties that produce cream or yellow flowers are becoming more available. Plants are cold hardy to zero degrees. Give them full sun to encourage flowering and supplemental irrigation in summer.

Alluaudia

Alluaudia procera (to 30 feet tall), commonly known as Madagascar ocotillo, is not well known, but it deserves to be. Nothing is quite like it for adding interest to a garden, especially when the plants are grown in multiples and allowed to create a mini-forest. Slender trunks that resemble stiff ropes are covered with regularly spaced, thumbnail-sized, oval green leaves that glow beautifully when backlit. Leaves fall off during dry periods to reveal the bone-white prickles of a naked stalk. Although foliage regrows when the rains return, withhold summer water.



Alluaudia procera in leaf.
Ramona, CA. Design by Rancho Soledad Nursery



Aloe barberae surrounded by *Euphorbia ingens* (background), red bougainvillea, pink-blooming *Euphorbia milii*, and *Agave parryi* (foreground). Phyllis Paul garden, Rancho Santa Fe, CA. Design by Bill Schnetz, Schnetz Landscape, Inc.

Aloe

Aloes come from parts of the world that receive summer rain and from other regions that do not. This is important to know when you are determining where to position them in the garden—should they go in areas that have no automatic irrigation or where they will receive regular water? Obviously, aloes that can tolerate regular summer water will do best when combined with perennials and other plants with similar requirements. Summer-dry aloes are a good choice for sections of a Southwestern garden that receive little attention, and they serve admirably as companion plants for natives. Irrigation requirements are noted for the aloes mentioned here.

Aloe barberae (formerly *A. bainesii*) grows 20 feet tall or taller and needs summer water. It is one of the largest succulents and will grow several feet a year given ideal conditions (regular water, full sun, and fast-draining soil). Rosettes of thick leaves, 2 to 3 feet long, sprout from branches that thrust upward from a fleshy trunk. These stiff, downward-curving leaves make *A. barberae* resemble the multi-headed trees in books by children's author Dr. Seuss.

Aloe barberae is frost-tender when young and can tolerate some dryness and neglect. It will do fine in a pot for a while but prefers being in the ground.



A field of *Aloe ferox* at peak bloom in mid-January.
Design by Rancho Soledad Nursery



Aloe plicatilis in bloom at Sherman Library and Gardens, Corona Del Mar, CA. On the left is *Crassula arborescens* (silver jade).



Aloe dichotoma. Design by owner Phil Favel, Elfin Forest, CA

Young trees, 3 to 4 feet high and sold in 15 gallon pots, tend to be single-headed (unbranched) until they reach 5 or 6 feet tall. A dwarf ‘Medusa’ cultivar is also available.

Aloe dichotoma (to 20 feet) will not tolerate summer water. It resembles *A. barberae*, but the trunk is thicker, the bark more coarsely textured, and the branching structure more compact. *Aloe dichotoma* also is more drought-tolerant and not as common. Native to South Africa and Namibia, it produces yellow flower spikes and requires exceptionally porous soil. *Aloe* ‘Hercules’ is a cross between *A. barberae* and *A. dichotoma*.

Aloe ferox (6 to 10 feet) needs summer water. It forms a single trunk with a crown of 3- to 4-foot spiny leaves. Columnar spikes of red-orange, gold, yellow, or white flowers rise several feet above the center of the tree in midwinter.

Aloe marlothii (to 8 feet) needs summer water and resembles *A. ferox*. Both form a single trunk and produce gloriously vivid, Popsicle-shaped flower stalks in winter. *Aloe marlothii* stems branch horizontally beneath columnar blooms,

and leaves are dotted with prickly points. *Aloe ferox* has spiny edges, fewer prickles, and unbranched blooms that resemble candelabras. With both, old foliage curves downward, dries, and clings to the stem. Similar in form is massive, single-trunked *A. thraskii* (to 6 feet or more), which has smooth, downward-curving leaves. It needs summer water and grows in beach sand in its native habitat of South Africa. Its comparatively short, columnar flowers are yellow with orange stamens and appear atop branched stalks.

Aloe plicatilis (to 5 or 6 feet) needs no summer water and has leaves that resemble fans made of large tongue depressors. The South African native produces orange-red flowers in early spring. Leaves grow to 12 inches long and are gray-green with translucent margins. Over time, the trunk becomes thick and gnarled. The plant should be thoroughly watered when dry and given excellent drainage.



Beaucarnea stricta

Beaucarnea

Single-stemmed *Beaucarnea recurvata* (syn. *Nolina recurvata*) grows 15 to 20 feet tall and has a bulbous base to 9 feet wide (in very old specimens). Common names include bottle palm or ponytail palm. Trees with long, downward-curving, grassy leaves resemble a feather duster anchored by a suction cup. The *caudex* (enlarged, woody base) stores water like a camel's hump, so not surprisingly, trees can go dry for long periods. Plants are striking when grouped, but they are also effective solo as garden exclamation points. Water sparingly in winter or the stem may rot. This species makes an intriguing potted plant that will thrive indoors, swell to fill its container, and get by with minimal soil and water. It is native to Mexico, produces spikes of small white flowers, and needs porous soil with excellent drainage.

Beaucarnea stricta, also native to Mexico, grows to 25 feet over time and has a canopy of blue-gray, strappy leaves, and a base textured like a tortoise's shell.



In this cactus garden, various opuntia (foreground) and cereus (background) surround an impressive gray-blue clump of *Agave parryi* var. *truncata*. Pitzer College desert garden

Cacti

Desert landscapes that showcase cacti are not lush and leafy, and flowers flash and fade, yet the plants' bold shapes and spikiness do have an eerie appeal.

By definition, cacti are succulents that belong to the family Cactaceae. Unlike other succulents, cacti have *areoles*—points from which spines (which are modified leaves), pads, flowers, or new branches grow. Another important distinction is that cacti are indigenous to the Americas. They range from Tierra del Fuego to near the Arctic Circle and can be found on grassy plains, along the coasts, in the mountains—and most notably—the deserts of the southwestern United States, northern Mexico, and South America. (Apart from agaves, dudleyas, echeverias, lewisia, and yuccas, most non-cactus succulents are from the Old World.)

Cacti store water in cylindrical, spherical, jointed, or padlike stems. Those cacti that are ribbed gradually expand and shrink, like an accordion, depending on the availability of water. Globular cacti are especially efficient at retaining moisture and minimizing evaporation. Because their stems contain chlorophyll, the plants are able to photosynthesize.

All cacti—all succulents, in fact—have a thick skin or protective coating that seals in moisture. This may be white and powdery (called *farinose*) or waxy and blue-green (*glaucous*). Spines also provide sun protection. Flowers are showy but short-lived. Typically, when stems are severed or broken, branches sprout from the exposed tissue, and roots grow from the broken-off piece.

The main difference in cultivation requirements between cacti and other succulents is that cacti prefer more light and less water. Generally, both do fine in

summer temperatures that range into the 90s, and during periods of winter dormancy, they can survive temperatures close to freezing. Most cacti need no water at all from early to late winter. In spring, water should gradually be increased, and in summer, cacti do best when watered every one to three days, depending on heat, humidity, and soil porosity. As a rule of thumb, soil should be coarse and fast-draining and allowed to go dry or nearly so between waterings. Avoid letting water pool at the base of the plant. Irrigate with drip, or, if cacti are on a steep slope, dig a trench or hole into the slope above the plants, and fill it with water. It will soak the soil and reach the roots without getting the crowns of the plants wet. Water dormant and newly planted cacti very little, or they may rot. Wait several weeks after planting, and then water thoroughly.

If you live in a desert climate, young agaves, yuccas, and cacti (and all soft-leaved succulents, regardless of maturity) should be grown in dappled shade or beneath shade cloth.



Cyphostemma

These long-lived, deciduous trees native to Africa are prized by succulent collectors. *Cyphostemma juttae*, from southern Namibia, will grow to 6 feet over time. The fleshy, bloated trunk is covered with papery, peeling bark. Thick, knobby branches produce pale blue-green, boat-shaped leaves with saw-toothed edges. Leathery leaves are large (12 inches or more) and cover the top half of the tree, pointing in all directions. In autumn, these are interspersed with grape-like clusters of translucent red berries. The summer flowers that precede these are yellow-green. Plants are frost tender and need exceptionally well-drained soil. Keep dry during winter dormancy.

Cyphostemma juttae



Dasyllirion

A dasyllirion (to 10 feet tall and as wide) is guaranteed to make a statement in any garden. Plants are shimmering pincushions of long, slender, ribbonlike leaves. *Yucca whipplei* and narrow-leaved *Agave stricta* provide a similar silhouette, but dasyllirion is more dramatic and purely spherical (although it does form a trunk, eventually). Plants are native to southern Arizona and New Mexico and require excellent drainage. They prefer full sun but will tolerate partial shade.

Yvonne Cave, in her book *Succulents for the Contemporary Garden* (2002), describes dasyllirions as “spiky balls” and “a dense bundle of stiffly erect olive green leaves.” *Dasyllirion longissimum* (syn. *D. quadrangulatum*) is commonly called Mexican grass tree; *D. wheeleri*, or desert spoon, has stiffer, gray-toothed leaves. Both bloom in summer, producing flower stalks that rise 12 feet or more; these resemble giant pipe cleaners, with tiny flowers held densely against the stalk.

Dasyllirion wheeleri grows at the edge of a canyon. In front are pink-blooming *Euphorbia milii*, and the ground cover is *Drosanthemum floribundum*. Richard Feltman garden. Design by Carl Dykema, Exotic Gardens nursery



Detail of *Dracaena draco* branching structure

Dracaena

Dracaena draco, known as dragon tree (to 30 feet high and as wide), is native to the Canary Islands off the coast of Morocco. Thick, cylindrical trunks resemble horizontally-banded columns; the red in the stripes is a reminder that the trees bleed crimson sap when cut. Solo trunks branch into stout arms that produce clumps of pointed leaves. Like *Aloe barberae* and *A. dichotoma*, *D. draco* trees have hefty limbs and stiff green leaves. All are slow-growing compared to woody trees, so large specimens tend to be uncommon and expensive. Nevertheless, a single tree makes a strong statement in a garden and offers an unforgettable silhouette.

Dracaena marginata (to 12 feet) is a common houseplant that does well outside, when acclimated. Its narrow green leaves fan out from the tips of slender limbs that bend and curve. Use it as a silhouette plant, against walls, and protect it from wind. *Dracaena marginata* ‘Colorama’ is a red-leaved, green-striped cultivar that glows brilliantly when backlit.

Euphorbia

Euphorbia is an immense genus that encompasses thousands of species, from tennis ball-sized succulents to tall trees. All have in common a milky sap that, depending on the variety, can be mildly to severely irritating to the skin. Great care should be taken when pruning or transplanting to avoid getting the sap on the skin—or, in particular, the eyes.

Among those euphorbias most useful in enhancing landscapes are tall, statue-like varieties that suggest saguaro cactus and impart to gardens a Southwest ambience. Numerous varieties are available—some smooth, others spiny—but those found most readily in nurseries include *Euphorbia ingens* (to 40 feet tall) and *E. trigona* (to 6 feet tall). The former starts out columnar, and as it ages, it becomes huge and massively branched. A monstrous sport of *E. ingens* loops hither and yon in front of the main house at Ganna Walska Lotusland in Santa Barbara, California.

Euphorbia trigona, native to tropical western Africa, often is seen as a potted plant, indoors and out. Three- and four-sided stems may have white, light green, or red marbling. In time, the plants become multi-branched. Active growth occurs during the spring and summer months. Withhold water during winter dormancy.



Dracaena draco in the landscape at Point Loma College, San Diego



Euphorbia ingens.

Courtesy of the Franciscan Friars of the Old Mission San Luis Rey



Furcraea foetida var. *mediopicta*, with *Agave weberi* at left and *A. angustifolia* var. *marginata* at right.

Furcraea

Furcraeas (to 15 feet tall) are in the agave family and resemble a cross between agaves and yuccas. Leaves that form large, fountain-shaped rosettes are more pliable than those of yucca and not as fleshy as an agave's. Furcraeas, like agaves, are *monocarpic* (they bloom once, and then die). *Furcraea foetida* var. *mediopicta* (to 5 feet) has cream to yellow stripes on leaves with green margins. It is particularly beautiful when grown in combination with similarly colored plants, such as variegated Saint Augustine grass (*Stenotaphrum secundatum* 'Variegatum'), chartreuse *Helichrysum* 'Limelight', or cream-and-green *Aptenia cordifolia* 'Variegata'. Leaves of variegated furcraeas are susceptible to sunburn, so situate plants where they are protected from intense sun.

*Kalanchoe beharensis*

Kalanchoe

Most *Kalanchoe* (pronounced *kah-lan-KOH-ee*) are small shrubs, but one notable exception is *K. beharensis* (to 6 feet, and, rarely, 9 feet or more). Its arrowhead-shaped leaves grow several feet long and resemble gray-green felt. *Kalanchoe beharensis* makes an intriguing and unusual specimen tree, either planted in a protected area of the garden or in a large pot. No other succulent—or plant, for that matter—looks quite like it, so position it where it will be noticed and admired. It produces panicles of small, yellow-green flowers in late winter.

Pachypodium

These upright shrubs form fleshy, bristled columns topped with lancelike, foot-long leaves. When plants are mature, they produce fragrant flowers that resemble plumeria blooms. Give full sun or partial shade or grow indoors as a potted plant, in bright light. Pachypodiums are tropical and prefer regular water except during winter dormancy. The plants will tolerate a mild frost, although it may stunt their growth. *Pachypodium lamerei* (to 18 feet tall and 5 feet wide), commonly called Madagascar palm, is the most widely cultivated variety.

*Pachypodium lamerei* and
Agave lophantha



A variegated yucca

Yucca

Yuccas (6 to 40 feet at maturity, depending on species) are native to the Southwestern United States and Central America. Compared to aloe and dragon trees, yuccas are much more common, faster growing, and less expensive to purchase. In a succulent landscape, the bayonet-shaped leaves of yuccas are useful for creating a harmonious repetition of the multi-pointed leaves of agaves, furcraeas, and aloes. Various species of *Yucca* grow throughout North America, so regardless of where you live, one or more is likely suited to your garden. Some have trunks punctuated with sword-shaped leaves that radiate in all directions; others are stemless shrubs with a porcupine silhouette. The bloom stalks of yuccas are massed with waxy, cream-colored flowers. Yuccas also make excellent container plants, but like all pointy succulents, they should be positioned well away from walkways and children's play areas.

Aloes and Agaves: Important Differences

Even horticulturists, upon encountering a previously unknown plant, can find it difficult to tell whether it is an aloe or an agave. Both form rosettes of broad, tapered, green or gray-blue leaves that spiral up and outward from a central stem.

Perhaps the most important reason to know the difference between the two is that aloes produce bloom spikes year after year, but after an agave flowers, it dies. Agaves are useful primarily for the symmetry of their foliage, not for their blooms—though these are indeed impressive and on large specimens may last several months. As it completes its life cycle, a mature agave, which has graced a garden for years, sends up an asparagus-like flower stalk. This dwarfs the plant and saps its energy. In some species, flowers along the stalk's branches eventually turn into mini plants (bulbils), so gardeners who are into propagation have hit the jackpot. But in general, this tendency to look lovely for a decade and

then die rather suddenly—leaving a floppy mess that has to be removed and a gap in the garden—is the greatest drawback to growing agaves. Anticipate this eventuality, and plan for it.

When attempting to identify a mystery plant, first examine the teeth that line the edges of the leaves. Barbs on agaves tend to be sharp, and the tissue will be denser (like a fingernail or horn) compared to the rest of the leaf. Toothed edges of aloe leaves tend to be less thorny. Mary and Gary Irish describe this in their book, *Agaves, Yuccas, and Related Plants: A Gardener's Guide* (2000): “In aloes there is no such border; what look like teeth on closer examination are just elongations of the leaf, like taffy being pulled off the leaf surface.”

Not all agaves and aloes have prickles and barbs, but when they do, agaves tend to have them only along the edges, and each leaf ends in a sharp, hard point. Unlike agaves, aloes may have barbs all over their leaves.

Other differences are not immediately apparent: Agaves have fibrous leaves; those of aloes are filled with thick gel—which to horticulturists is the key determinant. Aloes come from Africa and Madagascar; agaves from the Americas—in fact, they were initially referred to as “New World aloes.” Some aloes stay upright; others sprout multiple heads that eventually form a shrublike mound or elongate and creep along the ground (at a glacial pace).

Many, but not all, agaves and aloes produce pups—small plants that spring up around the base of the mother plant. These are a bonus, because they are easy to remove and replant elsewhere, thereby enhancing a garden through repetition. Harvest and grow pups in ornamental or nursery pots, and then transfer them into the garden should a plant (such as a mother agave) need to be replaced.



Agave potatorum



Aloe marlothii



Chapter Eight

Midsized and Shrub Succulents



Aeonium 'Cyclops' produces immense conical clusters of yellow flowers. Shrubby blue-green *Senecio talinoides* grows in the background; red flowers are *Pelargonium peltatum* (ivy geraniums). Arthur Salm and Susan Duerksen garden. Design by owners and Michael Buckner

Midsized succulents add texture and interest to the landscape. They range in size from 1 to 5 feet tall and do best in well-drained soil with moderate water until established, at which point most are fine with much less. Use shrub succulents as hedges, grow them beneath windows and in containers, and multiply them throughout the garden for design continuity. Those included here are frost-tender unless otherwise noted.

Aeonium

Aeoniums, many of which resemble green, dinner plate-sized daisies, form shrubs that vary from dense and compact, to airy forms. When they bloom, the entire rosette elongates, producing a conical inflorescence massed with cream-colored or yellow flowers. Spent stalks and the plants that produced them need to be removed, as they will wither and die. This normally detracts little from the appearance of the clump, since only a few rosettes bloom in any given year (usually spring through early summer).

Most species of *Aeonium* are summer-dormant, so their growth season is winter. Those mentioned here will tolerate summer water, if not excessive, but prefer to be on the dry side. Except for *A. arboreum* 'Zwartkop' and its hybrids, which do fine in full sun, aeoniums prefer partial shade, especially in areas that have harsh summers.

Many aeoniums, such as *Aeonium arboreum* (to 2 feet high), and thick-stemmed *A. undulatum* (to 4 1/2 feet tall), have overlapping pinwheel-like leaves. These top 1- to 2-inch diameter mini-trunks that get taller and lankier over the life of the plant. After a few years of growth, what began as a cluster of rosettes at ground level will become a diminutive forest. If you find the naked stems unsightly, conceal them with low, mounding plants that have similar cultivation requirements—such as *Kalanchoe uniflora* or *Portulacaria afra* 'Variegata'. Despite a tendency to become awkwardly elongated, aeoniums are beautiful when massed.

Aeonium rosettes, seeking photosynthesis, grow in the direction of the greatest amount of sunlight. This is not obvious when their trunks are short, but as plants grow, they lean, which can be unfortunate if they are viewed mostly from behind or are a key element of a geometrically planted arrangement.

Few plants make such a strong statement in the garden as *Aeonium arboreum* 'Zwartkop', so give careful thought to its placement. Dark-leaved plants are not always an asset; from a distance, a 'Zwartkop' cluster can appear to be a shadowy



Variegated *Aeonium* 'Kiwi'



Aeonium canariense

gap. Position the plants against a light wall, amid others with silvery or variegated foliage, or where the leaves will glow magenta when backlit. Black aeoniums are striking in containers, especially when juxtaposed with blue-leaved plants, such as *Festuca glauca* or *Senecio serpens*; those with yellow or red leaves, such as *A. 'Kiwi'*; and plants with red, orange, or yellow flowers. New cultivars hybridized by Jack Catlin at the Huntington Botanical Gardens—notably 'Cyclops', 'Plum Purdy', and 'Voodoo'—are becoming more available in succulent specialty nurseries.

Aeonium canariense and its hybrids form stout trunks topped with rosettes that squash together into a dense mass as they grow. These add lushness wherever they are planted and are effective on terraces, where they provide appealing texture at eye level.

Aeonium 'Sunburst' is a beauty well worth cultivating; it has green-and-cream-striped leaves edged in pink. Rosettes are 12 inches in diameter when mature and suggest giant daisies. Grow them where they will glow in early morning or late afternoon sun.

Blue-gray *Aeonium haworthii* consists of small (1- to 2-inch diameter) rosettes that overlap to create a dome of foliage over a woody, multi-branched shrub. These spread slowly via fibrous roots that grow along the undersides of stems. After several years, shrubs will form 2- to 3-foot-high mounds that lend superb texture to the garden. Unfortunately, it is impossible to trim the plants without exposing the woody interior—and no new leaves will fill the gap.



Aeonium 'Sunburst' with a dark-leaved, green-centered *A. arboreum* 'Zwartkop' hybrid and blue *Senecio serpens*. Jo Ann Allard garden, San Diego. Design by Koby's Garden Alchemy



Agave americana 'Mediopicta Alba' with a blue senecio (foreground) and *Euphorbia tirucalli* 'Sticks on Fire' (background). Carolyn and Herbert Schaer garden. Design by Michael Buckner



Agave 'Blue Flame', a cultivar introduced by Rancho Soledad Nursery in Rancho Santa Fe, California, has broad, blue-green, gracefully tapered leaves that curl at the tips. Design by Rancho Soledad Nursery

Agave

Comparatively small agaves make wonderful design accents, and each has its own character. Those mentioned here will pup, unless otherwise noted.

White-striped *Agave americana* 'Mediopicta Alba' (3 to 4 feet high and as wide)—though sometimes difficult to find and costly—stays small compared to *A. americana*. The cultivar's bold stripes, fountain shape, manageable size, and gracefully undulating leaves make it one of the most prized of ornamental succulents. In his book *The Jewel Box Garden* (2003), Vancouver author and garden designer Thomas Hobbs calls these "the Tiffany of agaves" and his garden's "estate jewels." He says, "I know not to mix them with 'lesser jewels' and allow them to star in their own pots on my terrace."

Agave angustifolia (3 to 5 feet high and up to 8 feet wide) has long, narrow, blue-gray leaves. For a striking combination of color and texture, position green-



Agave parryi var. *truncata*, center, with red *Kalanchoe luciae* and *Dymondia margaretae*. Design by Jeff Moore



Young *Agave victoriae-reginae* in nursery flats. Photo by Jeff Moore

and-white-striped *A. angustifolia* var. *marginata* alongside *Portulacaria afra* ‘Variegata’ or soft, mounding *Bougainvillea* ‘Raspberry Ice’.

Agave desmettiana ‘Variegata’ (2 feet tall and 3 feet wide) is becoming more widely available; it is not toothed, yet like *A. americana* ‘Mediopicta Alba’, it is variegated and has gracefully curved leaves.

Of all agaves, *Agave attenuata* (to 5 feet high and as wide) is perhaps the most popular in residential applications. Certainly, it combines ease of care with dramatic landscape enhancement. Its only downside is that it is frost-tender. It is noninvasive but pups readily, making it easy to spread throughout the garden (or, should there be an abundance, easy to give away). It is also the only agave to form a stem, or trunk. Its smooth leaves have no vicious barbs or points and form silky green rosettes that suggest large green flowers. Cultivar ‘Boutin Blue’ is distinctively blue in color. *Agave attenuata* ‘Variegata’ is ribboned with yellow and is one of the most spectacular foliage plants—particularly when combined with



Agave schidigera



When backlit, *Agave shawii*'s toothed edges are party colored: pink, orange, yellow, and red.



Agave gypsophila

orange or red flowers. Though uncommon, expensive, and slow growing, it does eventually produce pups.

Agave vilmoriniana (5 feet tall and as wide) has blue-green leaves that undulate, as though swept by an ocean current—hence the common name, octopus agave. Edges of the plant's long, slender leaves curl inward, creating a tubular look that is more pronounced toward the tips. Because of a lack of prickles, this is considered a “soft” agave. This species is *solitary* (does not form pups), but plantlets grow abundantly along the bloom spike.

If you do not mind sharp points, two readily available and elegant agaves stay small, are exceptionally cold-tolerant, and have an appealing symmetry reminiscent of an artichoke: *Agave victoriae-reginae* and *A. parryi*. *Agave victoriae-reginae* is dark green with white lines; these outline thick, rigid triangular leaves that end in short, sharp black points. The native of Mexico grows to about 12 inches high and about as wide. *Agave parryi* is silvery blue-gray with reddish black serrated edges and tips. Although native to the desert Southwest and Mexico and heat-tolerant, it is among the most cold-hardy of succulents—it has no problem with temperatures well below freezing. Plants seldom get larger than 2 feet tall and as wide. *Agave parryi* var. *truncata* has broader, rounder leaves.

Because they are spherical, both *Agave victoriae-reginae* and *A. parryi* are gorgeous when grown in round pots. They also are effective arrayed in multiples, in a bed of gravel, perhaps with a few boulders to add interest. Pups of *A. victoriae-reginae* are occasional and tend not to be prolific; *A. parryi* will form colonies of offsets, although some specimens remain solitary.

Certain agaves that are not grown widely are becoming more commercially available due to their exceptional ornamental value. Among these are *Agave bracteosa*, which has long, smooth, tapered, bright green leaves and a distinctive star-shaped center; *A. filifera* and *A. schidigera*, both of which have medium-green, bayonet-shaped leaves with white, threadlike filaments that curl from the edges; *A. gypsophila*, which is gray with serrated leaves that curve and curl; *A.* ‘Shark-skin’, with thick gray-green leaves textured like fine sandpaper; and *A. stricta*, which forms stiff, narrow-leaved pincushions. All attain 2 to 3 feet in width.

A few agaves have leaves edged in curved, sharp points that resemble shark teeth. Gray-blue *Agave guadalupana* is slow growing to 3 feet wide; *A. macroulmis* grows to 4 feet wide and likes cold, wet weather; and *A. shawii* reaches 5 feet tall. Similarly, *A. potatorum*, from the mountains of Mexico, is prized by collectors for its wide leaves with prominent leaf tips that grow several inches long and are rust-red and twisted. This small (to 2 feet tall and as wide) blue-gray agave forms a compact rosette well suited to containers.



Because it grows along the cliffs of the artists' community of Laguna Beach, California, *Aloe arborescens* has been immortalized in numerous paintings.



Aloe cameronii and *Senecio serpens*. Carolyn and Herbert Schaer garden. Design by Michael Buckner

Aloe

Shrub aloes form symmetrical, ever-expanding clumps of pointed leaves. Aloes mentioned here should be given summer water, unless otherwise noted.

Perhaps the best known aloe is *Aloe barbadensis* (aloe vera), which grows 2 to 3 feet tall. Some people grow aloe vera in windowsill pots in kitchens, because the gel in its leaves soothes minor burns and other skin irritations. Although it is useful and famous, from a design standpoint it is not a spectacular aloe. Its form is upright rather than rosette, and its flower spires are tall and slender.

Another commonly grown aloe, often found in frost-free coastal gardens in Southern California—seemingly undisturbed by nutrient-poor, sandy soil and salt spray—is *Aloe arborescens*, which forms multi-headed mounds of 1- to 3-foot-diameter rosettes. Tight clusters of serrated green leaves overlap like starfish clinging to a rock. Over time, a colony can grow to 10 feet tall and as wide. In midwinter, *A. arborescens* sends up torchlike spires of red-orange flowers. Some

cultivars are yellow.

Aloe arborescens 'Variegata' is not common but is gaining popularity with landscapers because its leaves are beautifully streaked with pale yellow. It does best in dappled sun or bright shade, enlivens low-light areas, and contrasts effectively with darker foliage.

One of the most striking aloes is *Aloe cameronii*, which has foot-long green leaves that turn cranberry-red when grown in full sun and that form overlapping clusters several feet high and wide. More common is *A. striata* (2 feet tall and as wide), known as coral aloe, with its stemless, gray-green leaves subtly striped and tinged with orange, lavender, and rose. Leaf margins are smooth and edged with orange. The branched inflorescence of this African native has pendant, tubular, orange-red buds.

Other aloes becoming more prevalent in nurseries include *Aloe vanbaleonii* (2 feet tall and as wide), which has red-edged chartreuse leaves that curve downward. Leaves are tapered gutters; flowers, yellow-orange spires. *Aloe elegans* (3 to 4 feet tall and as wide) has pale blue-gray upright leaves toothed in rose-red, with yellow flower spikes. *Aloe elgonica* forms attractive clumps (1 to 2 feet tall and 2 to 3 feet wide); its scalloped, medium-green leaves are dusky red at the centers of each rosette and on leaf tips (redder when stressed), and it produces red flowers that bloom in late winter and again in mid-summer. *Aloe rubroviolacea* (2 feet) resembles *A. striata* but has lavender-tinged blue-gray leaves. *Aloe vaombe* (to 6 feet) has curved reddish brown leaves and a trunk that elongates to form a small tree. And *A. speciosa* (multi-headed clusters to 6 feet tall and as wide) produces spectacular conical flowers that unfurl from the bottom up and resemble ruffled petticoats of cream, pink, rose-red, and green.

Bulbine

Bulbine frutescens (18-inch leaves, with flower stems of 2 to 3 feet) grows from corms and has juicy, pencil-thick leaves that are pointed at the tips. Airy sprays of tiny yellow or orange flowers top spaghetti-thin stems. Plants are especially effective when massed, are unfussy about soil, and will grow in semishade to full sun. Bulbine gets by on minimal water, but it becomes lush when pampered—to the point it may crowd other plants. Use it as a low-maintenance filler for spots in the garden where little else will grow.



At the California Center for Creative Renewal, *Bulbine frutescens* flowers behind *Aeonium haworthii* (right) and *Drosanthemum floribundum* (left). Design by owner Ellen Speert



Calandrinia grandiflora.
Design by owner Francesca
Filanc, Rancho Santa Fe

Calandrinia

Calandrinia grandiflora forms a low, mounding shrub with gray-green leaves. These send up slender, nodding flower spikes topped with clusters of neon bright purple flowers that resemble poppies. Plant *en masse* in humus-rich soil for airy dots of eye-catching color.

Cotyledon

Shrub-forming *Cotyledon orbiculata* (1 to 2 feet tall) is the most common cotyledon. It has paddle-shaped leaves that, depending on the variety, may be gray or green and edged with a thin ribbon of red. Pendant orange flowers with upward-curling petals appear in late summer. Reduce irrigation in summer, or roots may rot.

Crassula

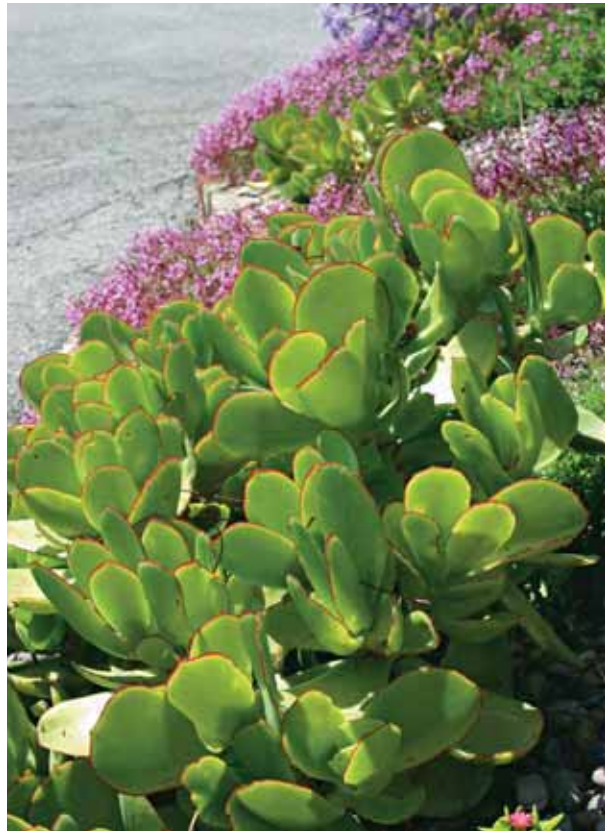
Crassula arborescens (to 4 feet high and as wide), also known as silver jade plant, has flattened oval leaves that are light gray, edged in maroon, and pinpointed with green dots. It produces pink flower clusters in spring. It is not as common as jade plant (*C. ovata*), but its care requirements are similar.

Crassula falcata (to 4 feet high and 2 ½ feet wide) is called propeller plant because its bladelike leaves overlap alternately along the stems. Gray foliage contrasts dramatically with spice-scented flower clusters that resemble crimson broccoli, in late summer into autumn. It is effective when massed, and even a single plant is striking when in bloom. Position it alongside a dry streambed of oval river rocks; the leaves of the plant will repeat the texture and color of the smooth gray stones.

Crassula ovata is perhaps the best known shrub succulent in the frost-free Southwest. These fat-trunked mini-trees, with green leaves the size of half dollars, are often the only survivors in neglected gardens, and they thrive in vacant lots and alongside roadways. It is ironic that green-mounding shrubs that take years to grow large, that require no water or pruning, and that are noninvasive, are so unappreciated. Homeowners and landscapers routinely remove decades-old, well-established plants when designing or renovating gardens. But smart ones use jade—and its less common, multicolored varieties—to advantage.

Jade leaves can be yellow, red, and green; streaked with cream and green; and as golden as egg yolks. All grow as readily and are as easy to care for as the common green variety, and all produce clusters of star-shaped flowers in winter or spring. Confined in a pot, jade will naturally bonsai. I have grown a jade plant in the same shallow, 18-inch pot for decades; its trunk is as thick as my arm.

Common *Crassula ovata* has oval green leaves edged in red and produces pinkish white star-shaped flowers. The cultivar ‘Hummel’s Sunset’ blends yellow, orange, and touches of green in its leaves, like rainbow sherbet. The more



Cotyledon orbiculata. Design by owner Peggy Petitmermet



Crassula ovata blooms in midwinter



Crassula tetragona in flower



Crassula arborescens

*Crassula ovata* 'Gollum'

sun, the more yellow it gets; in shade, it reverts to green. 'Tricolor' has white-and-green stripes, sometimes blushed with pink, and 'Gollum' and 'Hobbit' have spoon-shaped depressions on leaf tips ('Gollum' is more cylindrical).

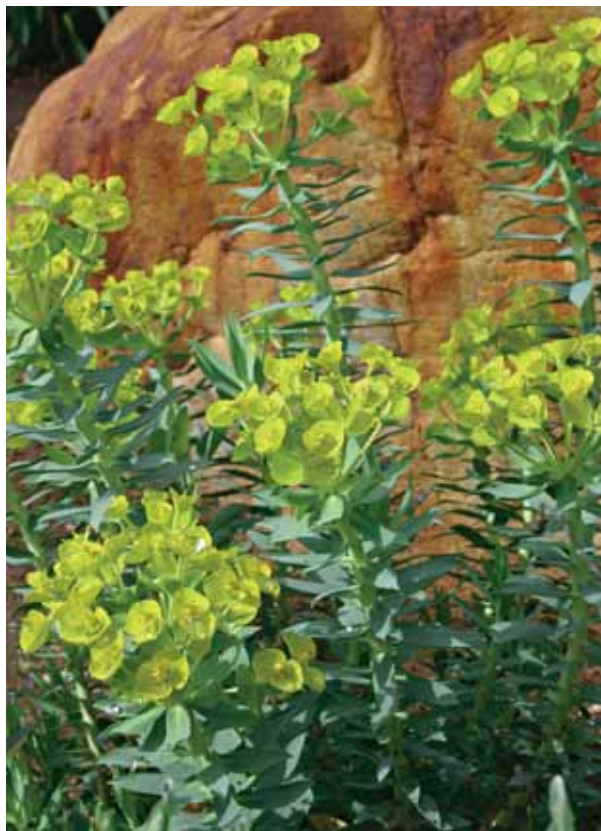
Crassula tetragona looks nothing like jade; instead, it resembles a miniature pine tree, its trunk packed with regularly spaced, slender, inch-long pointed leaves. Eventually, the plant will grow to several feet tall and become multi-branched. Creamy yellow flower clusters appear in late spring. It provides texture contrast for succulents with round or oval leaves and is useful as a vertical accent. Planted in pots, silhouetted against a plain backdrop, it adds height to mixed groupings.

Euphorbia

The family Euphorbiaceae encompasses numerous plants, including poinsettias and many cacti, with milky sap that can irritate the skin and eyes. Do not plant euphorbias near areas where children play.

Few plants offer the bright punch of orange-pink and red provided by *Euphorbia tirucalli* 'Sticks on Fire' (to 5 feet and as wide). This South African native resembles a leafless tree with multiple upright, cylindrical branches. Use it to lend the illusion of height to small-scale garden beds or containers.

It can be great fun to design with 'Sticks on Fire'. Wherever you plant it, it calls attention to itself. Plant it in a saucer-shaped concrete pot with crushed lava rock at its base, and it will suggest a bonfire. Combine it with plants with the same blend of sunset hues—such as *Gazania* hybrids—or contrast it with flowers or foliage from the opposite side of the color wheel, such as cobalt-blue lobelia, purple *Tradescantia pallida* 'Purpurea', or any succulent with blue-green leaves.



Euphorbia rigida



Euphorbia polygona. Design by Rogue McNeal



Euphorbia tirucalli 'Sticks on Fire' amid lava rock, with *Agave bracteosa* in the foreground, *Aloe vanbalenii* on the left, and *E. resinifera* at the upper right. San Diego County Fairgrounds. Design by Jeff Moore

The solid green variety of *Euphorbia tirucalli*, known as milk bush or pencil tree, is more common, grows larger (to 20 feet), and makes a good hedge. Its active growth period is in late spring and summer, and it prefers to go dry during the winter.

Similarly fleshy and also shrubby is *Euphorbia stenoclada*, which is silvery gray and multi-branched. Its silhouette suggests a loose pile of plump snowflakes. In its native habitat of Madagascar, it forms thickets. In a garden or container, it looks best grown solo, against a solid backdrop.

Euphorbia milii (to 4 feet high and 2 feet wide) is particularly useful in the landscape, because it blooms nonstop. Commonly called crown of thorns, the woody shrub is covered with spines. It provides

texture contrast to smooth and soft-leaved succulents, but it is most valued for bright red, pink, yellow, white, or coral bracts that appear on the ends of branches, framed by bright green oval leaves. Its growth habit depends on the variety (there are numerous hybrids) and ranges from tall and bushy to cascading.

Succulent shrub euphorbias (such as *Euphorbia characias* subsp. *wulfenii*, also known as *E. wulfenii*, and its hybrids) grow to 4 feet high and as wide and have upright stems, blue-green leaves, and domelike clusters of chartreuse bracts. This herbaceous perennial's lush yet airy silhouette makes it a great filler plant for beds and borders, and its fluffy texture works well as a counterpoint to large succulents, such as agaves.

Euphorbia rigida (to 2 feet high and 5 feet wide) is an outstanding perennial euphorbia and a good one to repeat throughout any succulent garden. Plants add soft texture and brilliant color in the spring, reseed freely but not invasively, and are hardy to 20°F. Its blue-green leaves are 1 ½ inches long, narrow, and pointed; in their centers, atop the flower stalk, grow clusters of chartreuse bracts that create a starburst effect.

Columnar, cactuslike *Euphorbia trigona* and *E. lactea* (candelabra plant, 3 to 4 feet tall) are good choices for indoor potted plants that must tolerate low light levels. A variegated form of the latter is a green so pale it is almost white.

Euphorbia polygona and *E. horrida* also resemble cacti and have an edgy appeal. The fat, cylindrical plants—which form clusters—have crenellated, vertical furrows that are wavy, as though collapsing under their own weight. Protruding from ribs that are dark in contrast with the plant's gray skin are toothpick-like spines (those of *E. horrida* are longer and fiercer).

Kalanchoe

Leaves of *Kalanchoe* have intriguing shapes and textures—from smooth, green, and glossy, to nubby, gray, and jagged. Flowers range from clusters of tiny stars to bean-sized bells on multi-branched stalks. Kalanchoes develop roots and leaves in spring and summer, and they flower in autumn and winter. The plants are found from South Africa to Vietnam, along the tropical latitudes of the world. Water during warm weather, when the soil is dry, and then withhold water during the winter as soon as temperatures drop below 50°F. Most of those mentioned here are native to Madagascar.



Kalanchoe tomentosa. Don and Jill Young garden



Scalloped, orange-red leaves of *Kalanchoe luciae* repeat the color of the terracotta pot and tile roof and contrast with azure cushions and water. Don and Jill Young garden



Brilliant mounds of *Kalanchoe uniflora* grow amid yellow and purple freesias at Mission San Juan Capistrano.

Bryophyllums are a type of *Kalanchoe* characterized by pendulous, tubular flowers and tiny plantlets that grow along the leaf margins. Plantlets fall to the ground, where they take root.

Kalanchoe tomentosa (to 18 inches high) has fuzzy leaves that suggest the ears of a plush rabbit, with brown stitching along the edges. Flowers are small, furry, yellow-brown bells. Provide bright light to full sun.

Kalanchoe blossfeldiana (to 12 inches high and as wide), a species that has been widely hybridized, is perhaps the best known kalanchoe. Look for it in garden centers and supermarkets in spring and autumn. These compact perennials have shiny, toothed leaves and cheerful clusters of hot-hued flowers. Keep old blossoms pinched off to encourage repeat bloom. Although typically used as a houseplant, *K. blossfeldiana* also can be grown outdoors when protected from frost. Discard and replace when plants become rangy.

Kalanchoe daigremontiana (syn. *Bryophyllum daigremontianum*), to 2 feet tall, is called maternity plant or mother of thousands because it produces plantlets along the edges of its notched, spotted leaves. With its lavender-pink leaves and

peach-colored pendant flowers, *K. fedtschenkoi* (syn. *B. fedtschenkoi*, to 18 inches tall) is worth having, though it is easy to grow to the point of being invasive.

Kalanchoe luciae, native to South Africa, has bloom stalks that rise 2 feet above 12-inch-high plants, but its foliage alone makes the plant worthwhile. Commonly called flapjack plant, its blue-green, paddle-like leaves are edged in red. (The more sun, the more red in the leaves.) The center of the plant elongates when it blooms, creating a silhouette reminiscent of a minaret. Since flowers sap the plant's energy, some gardeners routinely sever the flowering stalks as they emerge; this maintains the plant's compact shape and encourages new growth. *Kalanchoe luciae* is often confused with *K. thyrsiflora*, which is similar but has shorter, broader leaves that are blue-green.

Pale yellow in summer and blue-green in winter, the leaves of *Kalanchoe marmorata*, or penwiper plant (12 to 18 inches), are oval with dark blotches. It is native to Ethiopia and temperamental; grow as a potted specimen unless your garden never gets colder than 50°F. *Kalanchoe orgyalis* (to 3 feet) has spoon-shaped, velvety, bicolored leaves. These emerge red-brown and, as they age, turn silvery green with pale-gray undersides. *Kalanchoe pumila* is a low-growing (to 2 feet) silver-leaved shrub with masses of purple-pink, four-petalled flowers in spring. It spreads slowly and grows well in dappled shade. Oval leaves are serrated, and stems cascade. Good in hanging baskets.

Kalanchoe uniflora (12 to 18 inches) produces lip-stick-red, slender, bell-shaped flowers at the tips of ever-elongating stems. These are flexible and covered with glossy, dark green leaves. The plant's trailing habit makes it ideal for terraces and hanging baskets. It flowers in early spring, at the same time as freesias and other bulbs; when planted together, they create a scene as colorful as an Easter basket. Prune after blooming to keep the plant compact. Cuttings root readily; use them to fill gaps in pots or beds.

Portulacaria

Portulacaria afra (to 5 feet and as wide), commonly called elephant's food, looks like jade, but has smaller leaves and reddish brown stems. Cuttings sometimes are sold as "miniature jade plant," but mature specimens grow taller and have a looser branching structure. Use it as a screen or hedge. *Portulacaria* is native to Africa, where it grows in thickets and is eaten by elephants, who strip all its leaves. It



Portulacaria afra



Sansevieria trifasciata



Sedum 'Garnet Brocade'

provides as much as 80 percent of the elephants' diet, and the animals in turn help the plant propagate by breaking its branches, which root readily and form new stands.

Portulacaria afra 'Variegata' has burgundy-colored stems and dime-sized yellow leaves with green stripes down the middle. Unlike *P. afra*, it spreads laterally. Use it as a mounding ground cover, and allow it to cascade over terraces. Because its stems are gnarly and flexible, portulacaria makes a good weeping bonsai.

Sansevieria

Sansevieria trifasciata (2 to 4 feet tall), also called mother-in-law's tongue or snake plant, has stiff, lance-shaped, dark green leaves edged in yellow and banded with grayish white. Countless hybrids feature varying heights, shapes, and colorations. Many are remarkably tolerant of neglect and will thrive indoors, in pots, with minimal light and water. In the garden, grow it in full to partial

shade in well-drained, sandy soil. Like many plants with dramatic, upright leaves, *Sansevieria* is most effective when grown in multiples; position it along the base of a wall, or use it as a vertical accent for mixed groupings of potted succulents. *Sansevieria desertii*—not surprisingly—is a good choice for desert gardens.

Sedum

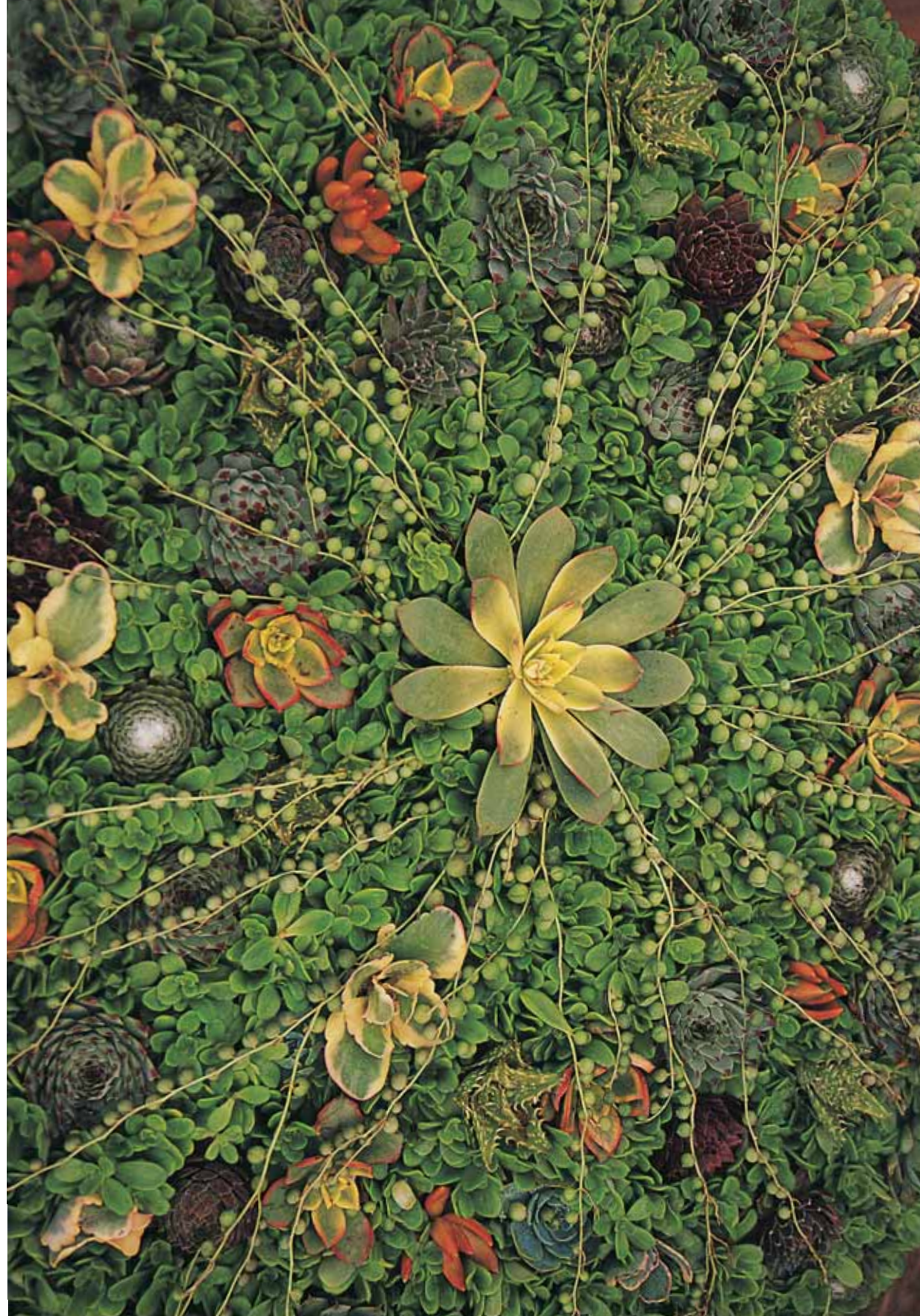
Sedum often is considered a rock garden or ground cover plant, but some of the most striking varieties are shrubby perennials that die to the ground in winter. Among those most prized in landscape design are *S. spectabile* (syn. *Hylotelephium spectabile*), *S. telephium* (syn. *H. telephium*), and *S. 'Vera Jameson'*. Plants have upright, fleshy stems that grow 18 inches to 2 feet in height. Flower clusters appear in late summer and autumn and are dense, rounded, and showy.

Senecio

Senecio talinoides (syn. *S. vitalis*) resembles low-growing *S. mandraliscae* and *S. serpens*, but it grows upright to form tall (to 3 feet) mounding shrubs. Leaves are finger-shaped, slender, tapered, and more green than blue. This plant is gaining popularity because it adds superb midheight texture to the garden. It spreads readily but not invasively and is summer-dormant.



Senecio talinoides with a variegated *furcraea* in the background



Chapter Nine

Small, Low-Growing, and Ground Cover Succulents

The spokes of a succulent pinwheel are defined by *Senecio rowleyanus* (string of pearls); in the center is an aeonium rosette. Design by Margee Rader

Use low-growing succulents to fill bare spots and to create rivers of color and texture throughout your garden. Those that creep along the ground also look good cascading over the sides of terraces and in hanging baskets. Plant small succulents in pots and rock gardens, and use them as ground covers for areas that receive no foot traffic.

Aloe

Blue-green *Aloe brevifolia* (short-leaf aloe) and reddish green *A. nobilis* (gold tooth aloe) both form tight clumps of dense rosettes, 3 to 10 inches in diameter. Leaves are covered with pale prickles that glow when backlit. In summer, plants send up slender orange spires.

Aloe saponaria (to 6 inches high and 18 inches wide) is commonly called soap aloe; supposedly, the sap will produce suds in water and can be used as a soap substitute. Plants form stemless rosettes. Pointed leaves with white speckles are yellow-green and short when grown in strong sun and dark green and elongated in partial shade. Leaf margins are serrated and dark brown. In late spring, *A. saponaria* produces tall (to 2 ½ feet) branching stems massed with tubular orange flowers. This native of South Africa is among the easiest to grow and most low-

Aloe brevifolia



maintenance of aloes, but it offsets freely and can be invasive in sandy soils. It does well in seaside gardens where few other plants will grow.

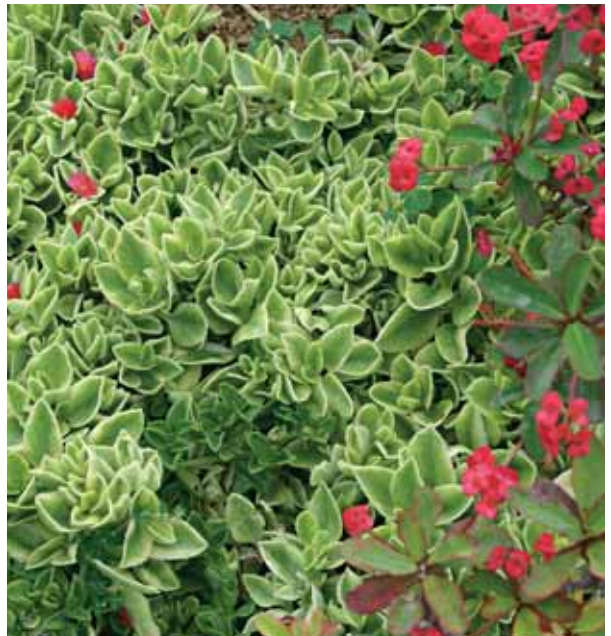
Aloe distans forms 4-inch rosettes of thick green and red leaves toothed with yellow; it creeps along the ground and produces parasol-shaped coral flowers in summer. *Aloe variegata* (to 10 inches in diameter) has tightly overlapping, tapered leaves that are dark green blotched with white. And *A. aristata* forms tight clumps of 12-inch-diameter, artichoke-like rosettes with leaves tipped with long threads.

Aptenia

Aptenia cordifolia ‘Red Apple’ (trailing stems to 2 feet long) has inch-long, heart-shaped, chartreuse leaves. It stays green year-round and produces small red flowers in spring and summer. *Aptenia* was not seen much until the 1970s; once introduced, it became a popular, maintenance-free ground cover used extensively to cover banks and slopes throughout the Southwest. *Aptenia* is drought-tolerant and will handle temperatures into the 20s. Less common but well worth seeking is *A. cordifolia* ‘Variegata’, a white-edged cultivar that looks striking in combination with other variegated plants or in contrast with dark-leaved succulents such as *Aeonium arboreum* ‘Zwartkop’.



Aloe nobilis

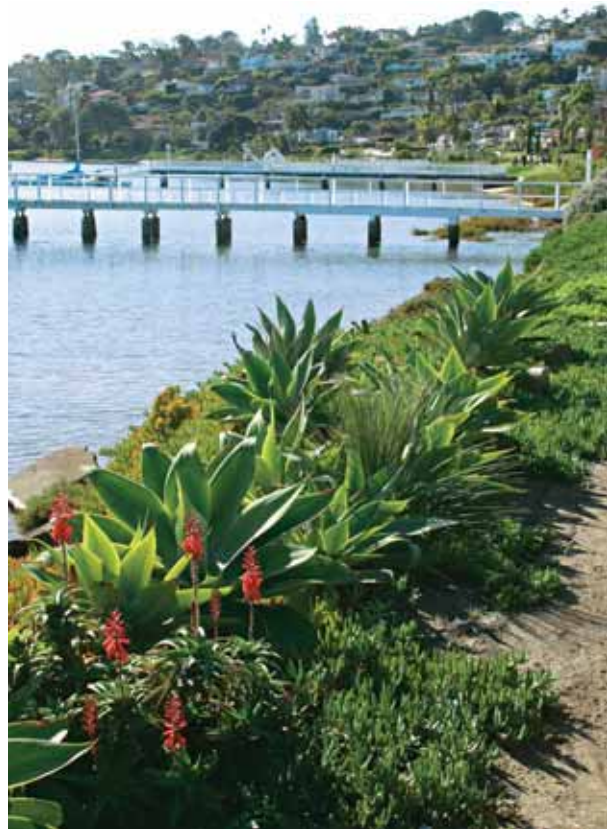


Aptenia cordifolia ‘Variegata’ with red-blooming *Euphorbia milii*. Carolyn and Herbert Schaefer garden.

Design by Michael Buckner



Bowiea volubilis



Carpobrotus blankets the ground beneath *Aloe gracilis* (in bloom) and multiple *Agave attenuata* plants.

Bowiea

Bowiea volubilis, or Namibian sea onion, is arguably the most unusual succulent. The bulbous plants resemble green tomatoes (to 6 inches in diameter) and sit atop the soil. From a small hole in the top of the bulb emerge long, slender green shoots that produce masses of frizzy, lime green leaves that twine around other plants. According to *Taylor's Encyclopedia of Gardening* (1961), "The plant is one of the most perfectly adapted drought-resistant species known. Its large bulb has been known to put forth an annual growth when stored on a museum shelf for four consecutive years." This South African native is summer-dormant; withhold water during that season or the plant may rot.

Carpobrotus

The dark green leaves of *Carpobrotus edulis* resemble thick French fries. Pale yellow or lavender flowers the size of teacups dot the sprawling plant a foot or more apart. *Carpobrotus* thrives along the seashore where little else does, and

it will rot if given too much water. Encourage lush growth with a high-nitrogen fertilizer. In frost-free areas that are not excessively hot, *carpobrotus* naturalizes readily and can be a nuisance—so much so, it is on the “enemies list” of many native plant societies. Do not use on cliffs to stabilize the soil, as the weight of the plants may cause fragile earth to crumble. *Carpobrotus* plants have a sweetish smell that intensifies in summer heat.

Similar in appearance to *Carpobrotus* is *Glottiphyllum*, a genus of clustering plants with fat, stemless leaves that range from several inches to more than a foot long, depending on the species. These tongue-shaped succulents come from South Africa, and though easy to grow, they are difficult to keep tidy; their thin-skinned, gelatinous leaves show every imperfection.

Cotyledon

Cotyledon tomentosa (12 to 18 inches high), commonly called kitten paws, has fat, fuzzy thumb-sized leaves tipped with reddish brown points. It prefers partial shade, does well in containers, and makes a good houseplant. *Cotyledon tomentosa* subsp. *ladismithiensis* variegated form has cream-colored streaks. It blooms in the autumn.



Cotyledon tomentosa

Crassula

Crassula coccinea ‘Campfire’ (to 2 feet) has pointed yellow leaves that turn bright red. Stems endlessly elongate, and tiny masses of cream-colored flowers appear in leaf axels.

Crassula multicava (to 2 feet) is a no-fuss trailing ground cover that thrives on banks that receive no frost or foot traffic. The plant does well beneath pines and oaks, where sun-loving ground covers will not grow. Gray-green, inch-wide oval leaves appear in pairs along ever-lengthening, floppy stems. In spring, these produce masses of white star-shaped flowers that, if not deadheaded, will form tiny leaves that become new plants. Although seldom seen in nurseries, *C. multicava* is easy to propagate from cuttings. It also spreads readily. Some gardeners find it a nuisance, but others welcome its lush and rapid growth.

Leaves (about 1 inch by 1 inch) of *Crassula perforata* grow on stems (to 18 inches) like stacked squares; each leaf is rotated at a 90-degree angle from the



Crassula multicava

Crassula coccinea 'Campfire' (lower right) is in flower in this boulder garden; *Graptopetalum paraguayense* and *Sedum* $\times$ *rubrotinctum* cascade alongside it. Also blooming, behind and to the left of the center boulder, is *Aloe arborescens*. Design by owner Christina Douglas





Its exquisite geometry and combination of colors—yellow, green, magenta, and gray-blue—make *Crassula perforata* an ideal choice for containers.

leaf above and below it. Growing tips produce slender and long-lasting bloom stalks. Other crassulas with tightly packed, flattened leaves on ever-elongating stems include diminutive, nubby *C. capitella*; dark green and stringy *C. muscosa*; and red-tinged, minaret-shaped *C. pyramidalis*.

Crassula pubescens (to 6 inches) has oval green leaves that turn crimson in full sun and when stressed. Clusters of cream-colored flowers top slender red stems in spring.



A sunny location brings out the color in a massed planting of *Crassula pubescens*. Design by owner Suzy Schaefer



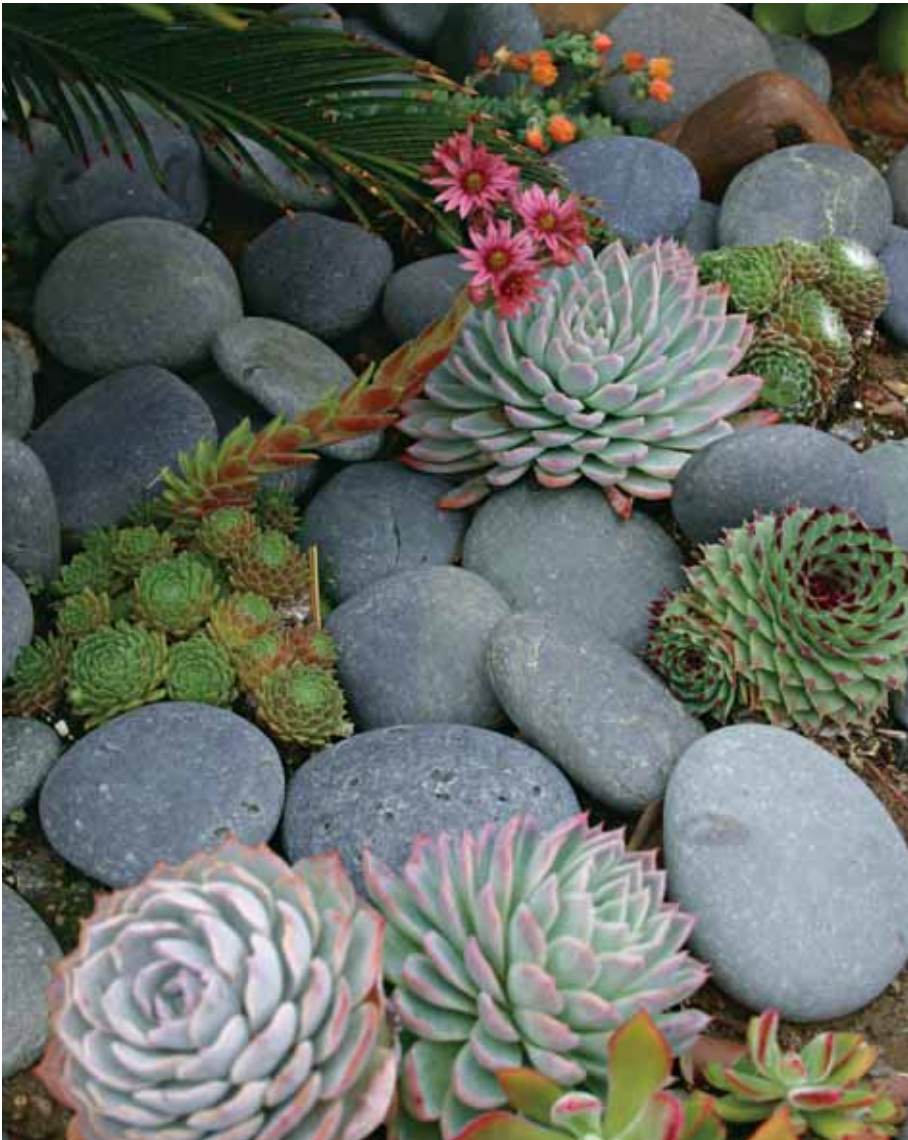
Crassula perforata up close



Dudleya brittonii at the
Huntington Botanical
Gardens

Dudleya

Dudleyas are winter-growers found on bluffs and cliffs, along marine-influenced areas of Oregon and California, as well as Arizona, Nevada, and Baja California. They can be difficult to cultivate because conditions have to be perfect: superb drainage, no summer irrigation, and adequate protection from frost, hail, rain, and intense sunlight. Even so, dudleyas can be stunning when grown in the niches of a rock wall, and they are fine in pots, providing they are sheltered in summer and watered only in winter. *Dudleya brittonii* (to 12 inches high and as wide) is a chalky gray rosette succulent that looks like it might be an echeveria, but its leaves are flatter and broader and the tips more pointed. *Dudleya edulis*, indigenous to San Diego County, has finger-shaped leaves that spread to a diameter of 12 inches or more. Similar to *D. brittonii* is *D. pulverulenta*, known as chalk dudleya; its leaf tips are more sharply pointed, and it is not as fussy about its growing conditions. *Dudleya farinosa*, native to coastal central and northern California, forms star-shaped rosettes of slender powdery white leaves. Plants reseed readily.



Three pale blue-gray echeveria rosettes combine with smooth, oval river rocks in this appealing niche garden. Also enhancing the composition are red-and-green *Echeveria pulvinata* (foreground, right), *Sempervivum arachnoideum* (in bloom), and *S. tectorum* (middle right).

Echeveria

The genus *Echeveria* includes more than 150 species of rosette succulents, many of which are baseball-sized and clump-forming. Most are native to Mexico, and all are prized for pink, coral, or rose-red bell-shaped flowers atop arching stems. In their native habitat, echeverias grow on rocky outcroppings—water drains quickly away from the roots, so the plants are never waterlogged. They do not need full sun but should be given light bright enough to prevent the plants from stretching, which spoils their tight symmetry. One potential drawback to echeverias is that they prefer mild temperatures (50° to 80°F). Even so, they are worth



Echeveria imbricata



Echeveria agavoides (lipstick echeveria)



Colorful, ruffled leaves are characteristic of echeverias introduced by hybridizer Dick Wright.



Echeveria pulvinata

growing in pots, where they invariably elicit gasps of admiration. A single specimen can be expensive, and they can be tricky to propagate, so use echeverias sparingly and display them prominently.

Echeveria imbricata (to 6 inches in diameter) forms silvery blue, saucer-shaped rosettes edged in cream. Leaves look metallic, and flowers are orange-red.

Echeveria agavoides has stiff, pointed chartreuse leaves that, when given adequate light, turn crimson along the edges. Because of its brilliant red leaf tips, nurseries sometimes refer to it as “lipstick echeveria.”

The showiest of *Echeveria* cultivars resemble cabbage roses and indeed are as large as cabbages. Some are beautifully ruffled along the edges. *Echeveria* ‘Afterglow’ (to 12 inches in diameter) has purple leaves rimmed with red. Similarly sized *E.* ‘Crinoline’ lives up to its name, as does *E.* ‘Blue Crinkles’. To keep the plants compact as the stems elongate, remove and replant their heads.

Echeveria pulvinata (6 inches high and 18 inches wide) is a showy, mound-ing plant with blue-green leaves tipped in red. Flowers appear in clusters that resemble little lanterns; these are five-petalled, pendant, and orange-red. This fuzzy plant is lovely when backlit.



Euphorbia

Low-growing *Euphorbia flanaganii* and *E. caput-medusae* (both spreading to 18 inches) share the common name Medusa plant, because their prostrate, snake-like leaves resemble locks of hair. Numerous green and bumpy stems radiate from the middle of the plant and produce a corona of tiny yellow flowers. Tendrils of *E. flanaganii* plants are looser, thinner, and messier than those of *E. caput-medusae*, which are cylindrical and symmetrically arranged, with a more clearly defined central point.

Euphorbia resinifera (to 18 inches high), from Morocco, forms tight clumps of inch-thick, four-sided, upright cylinders. It is hardy to 20°F (for short periods). Its poisonous sap is very irritating to skin.

Mounded *Euphorbia resinifera* and three *E. caput-medusae* plants (lower right) enhance a succulent seascape. Quail Botanical Gardens. Design by Jeff Moore and Bill Teague

Gasteria

Soft mounds of *Graptopetala paraguayense* and *Aloe brevifolia* (in bloom) add a touch of the exotic and lighten the formality of the entry to this Italianate estate. Green rosettes in the middle are *Echeveria 'Dondo'*. Design by Rosecroft owner Scott Clifton, San Diego

*Haworthia attenuata**Hoya* bloom

Gasteria

Gasteria (to 6 inches high and 12 inches wide) plants have thick, narrow leaves that often are stacked tightly atop each other or form stemless rosettes. Common varieties are dark green and speckled with white dots or blotches. They are useful in pots and rock gardens, prefer semishade, and cannot handle frost. The name comes from the shape of the flowers, which resemble little stomachs; these appear along slender, arching stems. A hybrid of *Gasteria* and *Haworthia*, *Gasworthia*, is covered with raised white protuberances that have a pebbly texture.

Graptopetalum

Graptopetalum paraguayense (clumps to 18 inches tall, spreads indefinitely), commonly known as ghost plant, resembles *Echeveria*. Silvery gray rosettes of oval leaves, pointed at the tips, are covered with a powdery film. Plants will turn gray-blue when grown in shade and pink-yellow in full sun. Leaves break off easily. Grow *G. paraguayense* in a container or as a ground cover for areas that receive no foot traffic. Plants produced by crossing *Graptopetalum* and *Echeveria* are known as *Graptoveria*.

Haworthia

Colonies of *Haworthia* grow so closely together that plants overlap. Their plump, wedge-shaped leaves form tight rosettes. One of the most common species, *H. attenuata* (to 12 inches), forms spiky rosettes of pointed leaves; it resembles a miniature aloe banded with raised white ridges. Grow it in tabletop pots and on windowsills, where its zebra stripes and tight symmetry can be admired. Protect it from intense sun, but provide enough bright light to bring out the reddish hues in the leaves. Haworthias are winter growers that go dormant in the hottest summer months. They are native to South Africa.

Hoya

These tropical, vining plants have rigid, glossy leaves and bowl-shaped clusters of star-shaped flowers so stiff and shiny they seem made of wax. Provide rich soil, regular water, warm temperatures, and sun protection. Plants thrive in bright shade and humid hothouses, blooming best when potbound. *Hoya carnosa* twines to 10 or 20 feet and has fragrant blooms. Water minimally during winter dormancy.





A bush-forming lampranthus rises above a carpet of *Drosanthemum floribundum*. Design and photo by owner Richard Feltman

Ice Plants

Ground covers formerly classified as *Mesembryanthemum* (and commonly called mesembs or ice plants) include *Delosperma*, *Drosanthemum*, *Malephora*, and *Lampranthus*. Stems can reach several feet in length and eventually form shrubby mounds. The name *ice plant* likely comes from the appearance of the leaves of certain varieties, which appear coated with ice crystals. Plants produce neon-bright flowers all at once and for several weeks in spring. The rest of the year they form a green or gray-blue mass with a smattering of blooms. Do not hesitate to mix colors; such combinations are simple, low-maintenance, and a delight to the eye.

Ice plants cannot be walked on, but they make great fillers for slopes and other low-traffic areas and fill in so densely they discourage weed growth.

Drosanthemum floribundum (rosea ice plant) is among the most common; its overlapping, dime-sized blooms are shades of shimmering magenta or lavender-pink. Brilliant orange *Eschscholzia californica* (California poppies) bloom at the same time—an easy combination to create in a garden, and one that is unforgettable.

Several varieties of ice plant blend beautifully alongside a driveway, with palo verde (*Parkinsonia aculeata*) in the background, and an *Aloe saponaria* hybrid in the foreground. San Diego. Design by owner Ava Torre-Bueno



A multicolored
assortment of *Lithops*

Lithops

Commonly called “living stones,” *Lithops* resemble small, rounded pebbles—a camouflage that protects them from grazing animals in their native habitat. The stemless, leafless succulents are from South Africa, where they subsist on minimal rainfall. They need infrequent watering, low humidity, protection from frost, and full sun four to five hours a day. When you bring home a pot of lithops from a nursery, introduce them gradually to direct sunlight to prevent burning the leaves. If the nubby plants elongate, they are not getting enough light. Give no water during summer dormancy. Do not be concerned if outer leaves shrivel; they do this to drain their fluids to promote new growth. In the fall, when mature plants begin to split open to send forth daisylike flowers, drench the soil occasionally. Allow it to dry completely between waterings. Let plants rest during the winter without water, and then give them several good drenchings in spring. Grow lithops in coarse, free-draining soil, in a pot deep enough (at least 6 inches) to accommodate their long taproots. Display them with rounded stones that have similarly mottled, earthy colors.

Another South African succulent similar to *Lithops* is *Fenestraria*, commonly called baby’s toes. Plants are capped with a window of translucent tissue that lets sunlight enter their short (1 to 3 inches), green, cylindrical stems.

*Pachyphytum oviferum**Portulaca grandiflora*

Pachyphytum

Though related to *Echeveria*, *Pachyphytum* is distinctive in that the leaves of its rosettes are fat and oval, like elongated pebbles (one common name is moon stones). *Pachyphytum oviferum* (to 6 inches in diameter) is so named because its leaves resemble flattened eggs. Pachyphytums are not found readily even in nurseries that specialize in succulents, so when you do run across one, it is worth buying and enjoying as a curiosity. Plants are fragile and leaves break off easily, so take care when handling them, and grow them in protected pots rather than in the ground. Pachyphytums produce arching bloom spikes massed with pendant flowers. New plants can be propagated from orphaned leaves.

×*Pachyveria*, a hybrid of *Pachyphytum* and *Echeveria*, has thick-leaved rosettes on stems that endlessly elongate. Numerous varieties exist, but the most common have leaves of pale purple-gray. ×*Pachyveria* is easily confused with *Graptoveria* and *Graptopetalum*; even experts can have a difficult time telling them apart. They are intriguing when juxtaposed with agaves and kalanchoes with similarly colored blue-gray leaves.

Portulaca

Portulaca grandiflora, also known as rose moss, is among the few annual succulents. Candy-colored flowers resemble poppies (or, if ruffled, miniature roses). This mat-forming ground cover with stems to 18 inches long is a cheerful enhancement to any garden, thrives in full sun and poor soil, and is beautiful in hanging baskets. Position where sunlight will make the petals glow. Flowers close in low light; look for new cultivars that stay open longer as sunlight wanes.



Schlumbergera hybrid



Sedum kimmachii in bloom

Schlumbergera

These epiphytic plants live in trees in the tropics and do best when grown in containers and hanging baskets. *Schlumbergera* hybrids are also called Christmas cactus, but unlike other cacti, they need humus-rich soil that stays moist. They produce profuse, decorative, vivid, and frilly blooms from flattened, jointed stems. Flowers range in color from coral to hot pink. To encourage bud formation, begin withholding water in late autumn (November in North America), and provide nighttime temperatures of between 50° and 55°F, plus 12 hours of darkness daily. Once buds form, keep the soil moderately moist. Give weekly applications of fertilizer while plants bloom.

Sedum

Sedum is a large genus, and low-growing varieties tend to prefer rocky terrain—hence the common name stonecrop. Ground cover sedums are appealing tucked into rock gardens, and they make good filler for container plantings. Nurseries and garden centers sell various ornamental sedums by the flat. Combine an assortment to make a patchwork quilt, to fill gaps in stone pathways, or line hanging baskets with flats of the fine-textured ground cover. (Invert the flat into the wire basket so the plants face outward, patch any gaps with moss, fill the basket with soil, and plant cascading succulents in the top.)

Sedum kimnachii (rosettes to 2 inches in diameter) has glossy chartreuse leaves and bright yellow spring blooms. Grow it where it will form a carpet, or use in terraces and hanging baskets as a cascading filler.

Sedum morganianum (donkey tail, burro tail) has ever-lengthening stems covered with overlapping pale-green leaves that pop off easily. From a distance, stems appear braided. Excellent in hanging baskets and rock gardens if protected from wind. *Sedum* ‘Burrito’ is one of several similar plants that have shorter, fatter leaves and “tails.”

Few succulents offer the bold color of *Sedum nussbaumerianum* (rosettes to 3 inches in diameter). Its golden bronze leaves make a striking contrast to gray-leaved succulents and artemisias. Unfortunately, it is difficult to find in nurseries. Although it forms lovely clumps, it eventually gets leggy. Growth is on stem tips, and as older leaves shrivel, stems are denuded.



Sedum morganianum



Sedum nussbaumerianum



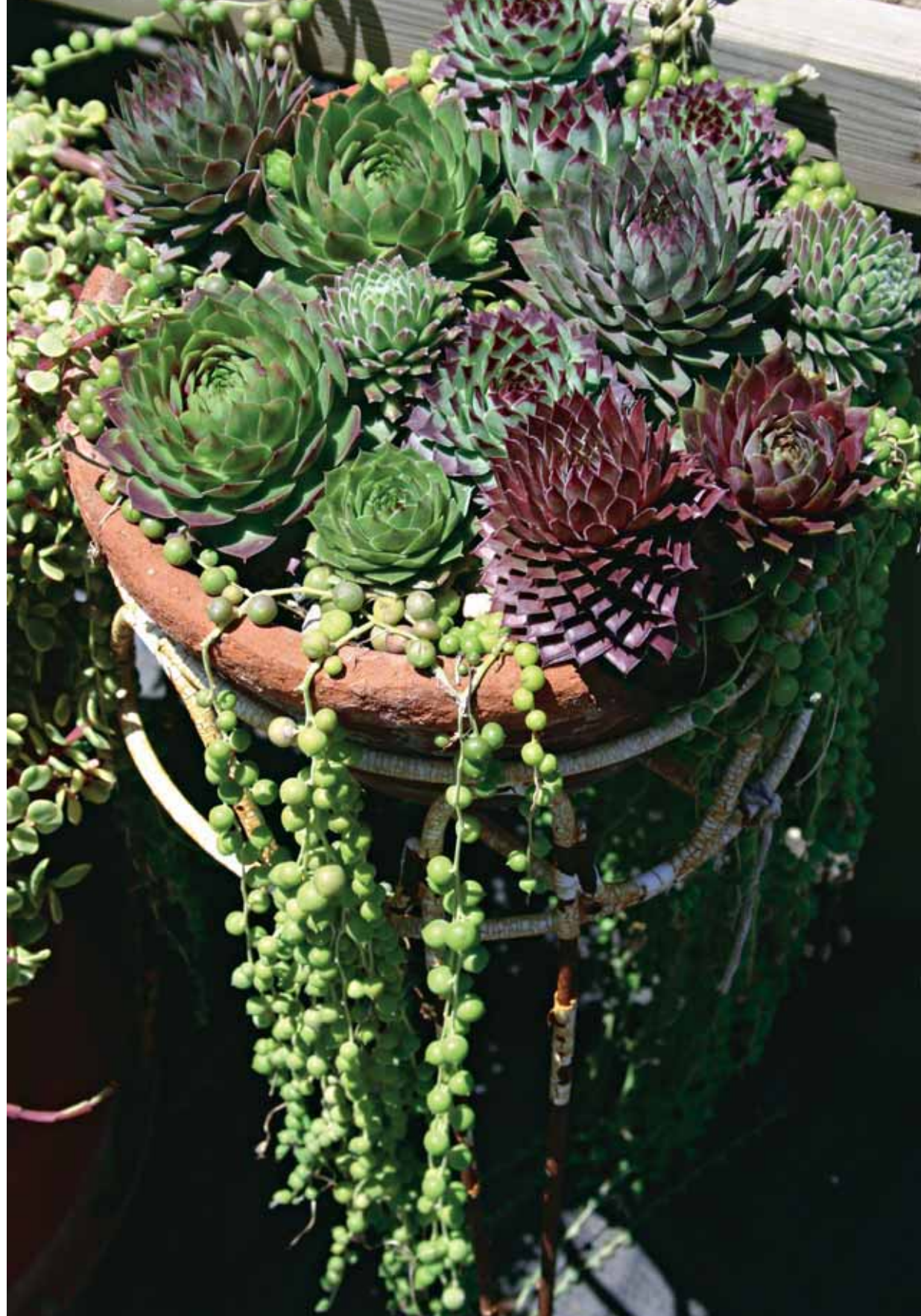
Sedum xrubrotinctum in bloom

One sedum that unfailingly delights children is *Sedum xrubrotinctum* (to 4 inches). Also known as pork and beans, the elongated leaves more closely resemble jelly beans.

Sempervivum

Sempervivum means always living, doubtless an acknowledgement of the plant's ability to grow on rooftops and in similarly adverse conditions. Tight balls of leaves with pointed tips eventually multiply into large clumps. Use sempervivums to create carpets of texture and color, either in wide, shallow pots or in rockeries. When a rosette flowers, it dies, but not all of a cluster's rosettes bloom at once, so the overall appearance of the grouping seldom is compromised.

Sempervivum comprises approximately 40 species and more than 3000 cultivars, with rosettes that range in size from a few inches to a foot or more across. Leaf color varies from deep burgundy to pale silvery white. Depending on the amount of sunlight the plants receive, some will turn yellow, orange, pink, or red. When grown in shade, most revert to green. Leaf texture can be glossy, waxy, or covered with downy hairs. The plants are summer-dormant, winter growers.





Senecio articulatus

Senecio

More than 1000 species make up the genus *Senecio*, and some are not succulents, but all have in common daisylike flowers arranged in small clusters atop slender stems. Garden designers delight in using two varieties of blue senecio as ornamental ground covers: *S. mandraliscae*, to 6 or 8 inches high, and *S. serpens*, to 4 inches. Few plants, succulent or otherwise, provide such striking color in the garden. Bright silvery blue leaves are cylindrical and tapered. Senecios are summer-dormant; they will tolerate some summer water but prefer to be dry.

Plants with bright red flowers or bracts—such as geraniums, *Euphorbia milii* (crown of thorns), or bougainvillea—are dramatic when combined with a blue senecio, as is *Echinocactus grusonii* (golden barrel cactus), which offers texture as well as color contrast. Blue senecios are also effective in monochromatic combinations.

Commonly called string of pearls, *Senecio rowleyanus* forms long strands of pea-sized green beads that make it ideally suited to—and striking in—hanging baskets. Similar in size and growth habit is *Ceropegia woodii* (rosary vine), a trailing succulent with heart-shaped, gray-green leaves mottled with white.

Stems of *Senecio articulatus* (candle plant) are jointed cylinders that resemble link sausages, except they are light green streaked with red. These lie along the ground or cascade down the sides of a pot until their weight causes them to break away from the parent plant.

*Stapelia gigantea* in bloom

Stapelia

Stapelia grandiflora, *S. gigantea*, and other plants of the genus grow to several feet long. Leaves are thick, four-angled, and stemlike (to 12 inches high) with ridged edges. In midsummer, plants produce plump, peaked buds that resemble the domes of a Russian Orthodox church. These open into furry, star-shaped flowers that are orange, red, or yellow, banded with brown or white. Flowers have a strong scent, which some say is similar to rotting meat—hence the common name, carrion plant.



Chapter Ten

Companion Plants

Red bougainvillea is a classic companion for blue *Agave americana*.

Dozens of ornamental landscape plants perform beautifully when given the same conditions in which succulents do best. Unless otherwise noted in their descriptions, the plants listed in this chapter share several cultivation requirements with succulents:

Prefer soil that drains well and is moderately fertile, but not necessarily richly amended

Are drought-tolerant and need minimal water once established

Do best in full sun or dappled shade (bright shade in desert areas)

Do not grow well with excessive rainfall or high humidity

Can tolerate some frost, but do best when temperatures stay above freezing

Thrive in areas with hot, dry summers when watered regularly

For greater detail on the growth habits and requirements of these and other dry-climate plants, consult the experts at your local nursery or a trusted garden guide. As you plan your landscape, pay particular attention to how large these plants will grow, and position them so they will not engulf slower-growing succulents nearby. The sizes listed with each entry indicate how large the plants will be at maturity, unless otherwise noted.

Annuals

Eschscholzia californica (California poppy)

Plants to 12 inches; flowers 4 inches in diameter

This poppy relative and state flower of California announces spring by blanketing hillsides with bright orange blooms. Satiny, five-petalled flowers fold at night and on cloudy days. Leaves are gray-green and feathery. California poppies are easy to cultivate by seed, and once naturalized, return year after year.

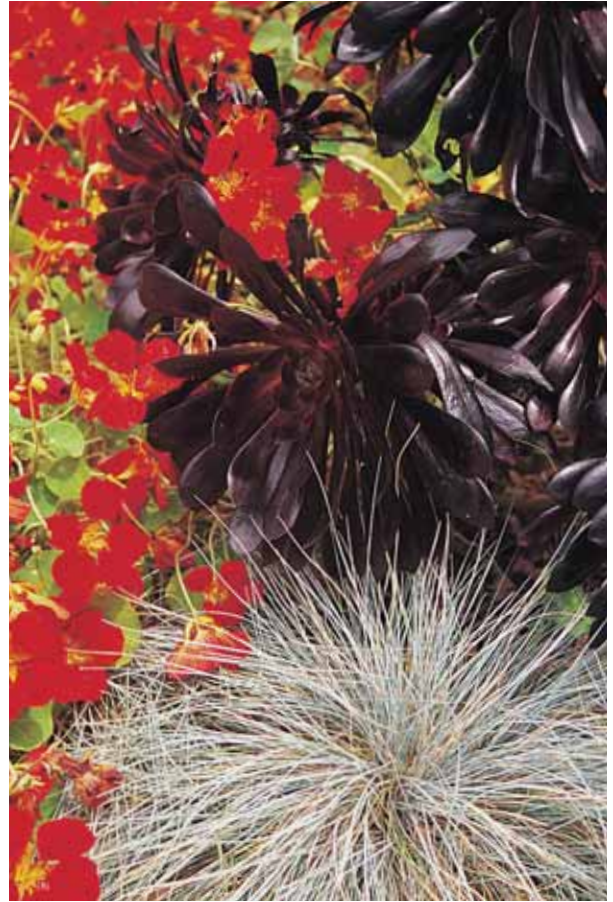
Tropaeolum majus (nasturtium)

Vines reach 6 feet or more; bush varieties spread to 3 feet

Leaves atop slender stems resemble paper-thin water lily pads. Flowers are edible and range in color from pale yellow to bright red and orange. This spring and summer bloomer starts readily from seed and prefers sandy soil and bright shade. Does well on slopes, especially in coastal areas. Can be invasive; do not let it smother nearby plants.



Eschscholzia californica and *Drosanthemum floribundum*



Tropaeolum majus with *Festuca glauca* and *Aeonium arbo-reum* 'Zwartkop'. Design by owner Bob Longdyke, San Diego

Bulbs and Corms

Babiana stricta (baboon flower)

Leaves 8 to 12 inches; flower stalks 12 to 18 inches

From the midst of fans of slender, ribbed green leaves rise S-shaped stems with flowers that resemble miniature, blue-purple gladiolus. Babiana is well suited to the Southwest, where growing conditions are similar to its native South Africa: wet winters followed by prolonged dry spells. Naturalizes readily. After foliage turns dry and brown, harvest bulbils that hug the base of flower stems. Plant in drifts for swaths of color in spring.

Amaryllis belladonna (belladonna lily, naked ladies)

Plants 12 inches high and 2 feet wide; flower stalks 2 to 3 feet

Onion-sized bulbs store water during winter rains and need little or no irrigation thereafter. Lush, strap-shaped foliage appears in late winter and spring



Amaryllis belladonna



Sparaxis tricolor

and then dies back. In late summer, sweetly scented, pink lilylike flowers appear on leafless stems that rise from the tops of exposed bulbs—hence the common name naked ladies. Bulbs are long-lived and like to be crowded; they may not bloom for a year or more once disturbed.

Crocosmia ×crocosmiiflora (montbretia)

Leaves 3 feet; flower spikes 18 inches

Flowers grow along arching, airy stems above lancelike, floppy foliage; they range in color from yellow to scarlet. Plants offer welcome color during midsummer months, when many perennials are dormant. From South Africa.

Sparaxis tricolor (harlequin flower)

Leaves to 12 inches; flower stems 12 to 18 inches

One of the first bulbs to appear in spring, sparaxis has dainty, six-petalled flowers atop slender stems. Most common colors are red or white, although pink, orange, and purple varieties are available. Flowers have a distinctive yellow center set off by a dark ring. Naturalizes readily; plant in well-drained soil and withhold summer water. Harvest bulbils from the base of each flower stem when foliage dies back.

Watsonia borbonica

Leaves 2 1/2 feet; flower stalks 4 to 6 feet

Watsonia provides eye-level color; when planted in drifts, it is striking viewed from a distance. Like other South African bulbs, it prefers dry summers. Colors vary, but white, coral, and pink are most common. Flowers resemble gladiolus but are smaller and more slender. Plant bulbs at least 6 inches deep to help anchor tall stems, which may need to be staked. Divide clumps after several years.



Dymondia margaretae

Ground Covers

Dymondia margaretae

2 to 3 inches; spreads indefinitely

This South African native makes an excellent lawn substitute, and there is no better drought-tolerant ground cover for high-traffic areas. You can even park cars on it. Plants with fleshy roots form an interlocking mat of slender green leaves with white undersides. Produces insignificant, daisylike yellow flowers.

Myoporum parvifolium

3 to 6 inches; spreads up to 9 feet

This trailing ground cover has dense green leaves that resemble large grains of rice. Dime-sized white flowers appear in summer. *Myoporum* fills in rapidly; space plants 6 to 8 feet apart. It is good on slopes and banks, but not for areas with foot traffic. Hybrids have red stems and purple-green new growth.

Rosmarinus officinalis Prostratus Group (prostrate rosemary)

To 2 feet; spreads 4 to 8 feet

Prostrate rosemary (often seen as 'Prostratus') cascading over a terrace or retaining wall is a green waterfall, sparkling with tiny blue flowers. Plants are tough, fragrant, and long-blooming (autumn through spring). Tender new growth can be harvested for use in cooking. Plants eventually become woody and will need to be replaced or removed.



Prostrate rosemary trails over a wall.



Yellow *Anigozanthos flavidus* grows along a low wall below a red bougainvillea sharing a pot with a variegated agave. Design by Russ Johnston and Denny Smithgall, SJA Inc.

Herbaceous Perennials

Achillea millefolium (common yarrow)

Plants 12 to 18 inches high; flower stalks 2 to 3 feet

Yarrow has soft, ferny, aromatic leaves and flowers that form flat-topped clusters. Colors include white, salmon pink, rose, and yellow. Plants spread by underground runners but are not invasive unless pampered by ample water and rich soil. Cut back in summer, after bloom.

Agapanthus orientalis (lily of the Nile)

Shrubs 2 to 3 feet; flower stalks 4 to 5 feet

This South African native forms fountainlike clumps of strappy leaves, above which rise spherical, starburst clusters of trumpet-shaped flowers in shades of white, lavender, or purple-blue. Plants are so easy-care, they are used to landscape street medians. They also do well in containers and alongside swimming pools. Dwarf varieties are available.

Anigozanthos flavidus (kangaroo paw)

Foliage 2 to 3 feet; stems to 5 feet

Unusual flowers on tall, branching stalks are fuzzy and tubular and resemble an animal's paw. Hues range from gold to burgundy to lime green. Flowers attract hummingbirds and are good in cut arrangements. Foliage is upright and strappy. Plant in well-drained, sandy soil, and repeat for best effect. Will bloom continuously from late spring to autumn if spent stalks are removed.

Artemisia

Size varies

Plants in this genus most useful as companions for succulents have finely divided, silver leaves—such as *Artemisia* 'Powis Castle' (3 feet tall, 6 feet wide). Artemisias are tough and unfussy, despite their delicate appearance. Flowers are insignificant. Shrubs become leggy; in winter, cut them back by two-thirds to ensure compact growth in spring.

Centranthus ruber (Jupiter's beard, red valerian)

2 to 3 feet

Showy, conical clusters of tiny red or white flowers atop slender, branching stalks make this plant desirable, but take care not to give it humus-rich soil

and summer irrigation, or it will take over. Grow in dry areas of the garden with poor soil, away from cultivated beds. Remove spent flower stalks to prevent reseeding. Blooms spring through summer, and then top growth dies; cut to the ground to keep new growth lush.

Coreopsis

1 to 2 feet

This genus of the daisy family comprises around 80 species of annuals and perennials. Flowers on slender stems appear in spring and summer, in bright hues of yellow and gold. Many of the perennial varieties will grow in poor, stony soil. Use coreopsis for a no-fuss filler that is effective alongside succulents with blue-gray leaves.

Dietes bicolor (fortnight lily)

2 to 4 feet

These clump-forming plants with stiff, narrow leaves and six-petalled flowers resemble Japanese iris. Common *Dietes iridioides*, which grows large and produces white flowers, is not as versatile or desirable a landscape plant as smaller *D. bicolor*, which has butter-cream flowers marked with three yellow-brown dots. Plants bloom spring through autumn in bursts that last two weeks. Deadhead to prevent reseeding. Divide in autumn or winter.



Centranthus ruber



Coreopsis



Erigeron karvinskianus



Gaura lindheimeri

Encelia farinosa (brittle bush)

2 to 6 feet

This desert shrub is native to the Southwest and northern Mexico. Early settlers used its resinous stems to make incense. Shrubs are airy, with silvery leaves that contrast with clusters of bright yellow daisies. Will survive on rainfall, but will grow larger—and lankier—with irrigation.

Erigeron karvinskianus (Santa Barbara daisy, Mexican daisy)

10 to 20 inches

Mounding shrubs with fine, wiry stems produce a profusion of delicate, dime-sized, daisylike flowers in pink or white. Use as a filler for flowerbeds, in hanging baskets and terraces, or as a ground cover. Can be invasive if given rich soil and ample water.

Gaillardia ×grandiflora (blanket flower)

2 to 4 feet

Daisylike flowers appear from early summer through autumn, in hot combinations of orange, red, and yellow. Leaves are slightly lobed and hairy. Best sown



Gazania

from seed, but can be propagated by division or cuttings. Requires minimal maintenance. Makes a good filler around large agaves and aloes.

Gaura lindheimeri (gaura)

3 to 4 feet

Pink or white flowers atop threadlike stems resemble butterflies. Flower spikes bear closely set blossoms that open a few at a time. Deadhead spent blooms or plants will look messy. Though delicate in appearance, *Gaura lindheimeri* has a deep taproot that aids drought-tolerance. Best cultivated from seed. Use to provide textural contrast alongside thick-leaved succulents, such as *Agave guiengola*.

Gazania hybrids (African daisies)

Plants 6 inches; flower stems 6 to 10 inches

These South African natives produce brilliant sunflower-like blooms in hues that include cream, orange, scarlet, and reddish brown. The first flush is in early spring, followed by smattered bloom through autumn. Gazanias are spectacular when massed on slopes. Undersides of deeply lobed leaves are silvery and sometimes hairy. Petals may have a dark starburst or ring of black dots surrounding the yellow center. *Gazania* resembles *Osteospermum* and *Arctotis* but is brighter and tougher.

Hemerocallis hybrids (daylily)

Size varies according to variety

Few flowering perennials are as accommodating as daylilies. Reblooming plants produce flowers from spring through autumn, tolerate almost any kind of soil, and do not mind being over- or under-watered. Daylily hybrids come



Yellow *Hemerocallis*. Paul Huntzinger garden.
Design by Ecosystems Imagery



Leonotis leonurus

in a multitude of flower colors, including magenta, pink, and red, which effectively echo the hues of red-leaved succulents, such as *Kalanchoe luciae*. Striking when massed. Dwarf varieties are available.

Lavandula (lavender)

Size varies

Lavender offers color, fragrance, texture, and ease of care. Purple floral spires top slender stems that rise above dense, ferny, gray-green foliage. For best bloom, plant in an area that gets at least six hours of sunlight daily. Plants do well on decomposed granite slopes and require little or no fertilizer. Shear after flowering, twice a year, to keep shrubs tidy. Soil should be moist, but not wet, while plants are young. Once established, water sparingly.

Leonotis leonurus (lion's tail)

4 to 6 feet tall and as wide

This South African native offers bright color in summer and autumn, with furry tubular flowers that are tawny orange—like a lion's tail—and that form ball-shaped tufts along tall, upright stems. Narrow leaves are toothed and 2 to 5 inches long. Give full sun and rich soil that drains well. Cut back heavily in

early spring to encourage new growth and bloom. Stunning when grown alongside blue agaves. Reseeds freely.

Limonium perezii (sea lavender, statice)

To 3 feet with 2- to 3-foot flower clusters

Tiny, delicate flowers are papery and massed atop stiff, branched stems—ideal for dried floral arrangements. Large and leathery leaves at the base of flower stalks form dense clumps. Plants tolerate heat but not frost, and they prefer sandy, fast-draining soil. Blooms from late winter into spring, at the same time as many aloes; the two flower colors—lavender and orange—complement each other nicely. In a benign climate, statice reseeds freely, to the point of being invasive. Thrives in beach gardens.

Mimulus (monkey flower)

3 or 4 feet, depending on variety

These shrubs are characterized by tubular, flared flowers that suggest grinning monkey faces. Flowers range in color from brown and orange through yellow, pink, and crimson. Most species are native to cool Pacific coastal regions that do not experience frost. Shrubs are woody perennials that need pruning to



Limonium perezii amid
boulders. Design by owner
Peggy Petitmermet

maintain compactness. Grow in full sun along the coast, part shade inland.

Oenothera speciosa (Mexican evening primrose)
1 to 3 feet

Showy pink flowers bloom so profusely in spring they resemble cumulus clouds. But use with caution; this exquisite perennial is nearly impossible to eradicate once established. Underground rhizomes will invade any area where soil is moist. Do not place Mexican evening primrose near prized, well-watered plants in rich soil; it will grow rank and smother the others. Plant only in containers, in poor-soil areas that go dry in summer, or where surrounded by several feet of hardscape. Mexican evening primrose is an excellent companion for *Agave americana*; the primrose cannot choke the agave, and the fluffy, somewhat twining flowers contrast beautifully with the agave's bulk.



Oenothera speciosa



A variegated phormium is surrounded by red bougainvillea and *Agave americana*.

Pelargonium peltatum (ivy geranium)

18 to 24 inches; spreads to 5 feet

Bright green, glossy leaves resemble ivy, and plants have an ivylike growth habit. Trailing stems produce vivid, long-lasting blooms from spring through autumn. 'Balkan' strains are particularly tolerant of hot, dry conditions and are self-deadheading (the dry flowers fall off the plants without assistance). Makes a good plant for hanging baskets, window boxes, and terraced plantings. Combine ivy geraniums that have white-edged leaves with variegated succulents, such as *Agave americana* 'Mediopicta Alba'.

Phormium (New Zealand flax)

Size varies

With their up-thrusting, sword-shaped leaves, phormiums are dramatic foliage plants and make a striking backdrop when grown solely or *en masse*. Their spiky, fan-shaped silhouettes repeat those of many succulents, such as yuccas and agaves. In summer, flax produces tall, branching flower spikes that attract nectar-loving birds. Olive-green and bronze varieties of *Phormium tenax* are most common, but colorful hybrids of *P. tenax* and *P. cookianum* (such as peach-toned *P.* 'Maori Maiden') are gaining popularity.



Romneya coulteri blossom

Romneya coulteri (matilija poppy)

6 to 8 feet; spreads indefinitely

These summer-flowering, woody-stemmed perennials have gray-green leaves and 6-inch-diameter, crinkly white flowers with yellow centers (they resemble fried eggs). *Romneya* can be difficult to establish, and then difficult to eradicate once established. Plants propagate by underground rhizomes and will encroach on watered garden beds. Use in borderline areas that go dry in summer. White flowers on tall stems make an airy backdrop and are effective in contrast with large agaves, aloes, and yuccas. Cut to the ground in late summer or autumn.

Santolina chamaecyparissus (lavender cotton)

2 feet tall; 3 feet wide

Use this mounding, spreading shrub to add color and texture to bare spots in the garden. Gray foliage is fine-textured, dense, and aromatic; profuse summer flowers resemble yellow buttons. Cut almost to the ground in winter. Gets woody and unattractive if not pruned back.

Senecio cineraria (dusty miller)

2 feet tall and as wide

This perennial shrub's silvery foliage is lovely when massed. Use as a foreground plant in semishaded spots and in pots and window boxes. Prune to maintain compactness. Contrast dusty miller with red-leaved succulents and magenta-black *Aeonium arboreum* 'Zwartkop'. Place alongside pathways to reflect light at night, and use as a filler in floral arrangements.



Tradescantia pallida 'Purpurea' with aloes and other succulents. Design by Judy Casanova



Strelitzia reginae flower

Strelitzia reginae (bird of paradise)

5 to 6 feet high and as wide

These magnificent, fan-shaped shrubs are grown for their flowers, which resemble exotic orange-and-blue birds. Blooms best during cooler months and when its tuberous roots are crowded. Leaves are green-gray and oar-shaped. Give full sun to part shade and protect from frost. Get young plants off to a good start with regular water and well-drained soil enriched with organic matter. Once established, bird of paradise is tough and drought-tolerant. Does well in coastal gardens.

Tradescantia pallida 'Purpurea'

1 to 1 ½ feet; spreads indefinitely

Because of the deep magenta-purple of its leaves, this creeping perennial from Mexico adds rich color to succulent gardens. It forms spreading clumps, and although it will grow through other plants, it is not invasive. Leaves are long, tapered ovals; pink flowers are small and insignificant. Protect from frost and intense sun and provide moderate water.

Zauschneria californica (California fuchsia)

1 to 2 feet

The flowers of this low, spreading California native are bright red and resemble fuchsias; leaves are lancelike and dark green. Blooms from late summer into autumn. Roots can be invasive, and plants will look rangy if not pruned back in winter.

Trees and Shrubs

Abutilon palmeri (Indian mallow)

To 5 feet

Abutilons have pendant, bell-shaped flowers that attract hummingbirds. *Abutilon palmeri* is native to the low deserts of California and Arizona. In spring, it produces clusters of small (1-inch) golden-orange flowers. The plant is prized for its velvety, heart-shaped leaves, which can be as large as dinner plates. Protect from frost.

Acacia

Size varies by species; average is 30 feet

The dozen or more species of *Acacia* sold in nurseries range from low-growing shrubs to tall, spreading trees. One of the most popular, *A. baileyana*, grows rapidly to 10 or 15 feet and has fine, ferny, gray-green foliage; it produces masses of fluffy yellow flowers in midwinter. The downside to most acacias is that they are short-lived and shallow-rooted; do not plant them in exposed areas prone to gusty winds. Good choices for succulent gardens include *A. cultriformis* (knife acacia, to 10 or 15 feet high and as wide), a multistemmed tree with small, sickle-shaped leaves; *A. karroo* (karroo thorn, to 25 feet tall), striking to look at, with wicked thorns in pairs and yellow puff-ball blooms; *A. podalyriifolia* (pearl acacia, 10 to 20 feet high, spreading 12 to 15 feet), which provides good winter color but cannot tolerate summer water; and *A. willardiana* (palo blanco, to 20 feet high and 10 feet wide), with papery, peeling white bark and stringy leaves.

Alyogyne huegelii (blue hibiscus)

6 to 8 feet

This lovely, open-branching mini-tree from Australia has dark green foliage; flowers are glossy purple and suggest single-petalled hibiscus. Satiny petals are delicate and translucent. Give full sun, shelter from wind, and protection from frost. Plants do best in fertile soil that drains well.



Acacia tree in bloom alongside *Aloe arborescens*. Rancho La Puerta, Tecate, Mexico. Design by Sara Livia Brightwood



Alyogyne huegelii

Arbutus unedo (strawberry tree)

To 30 feet

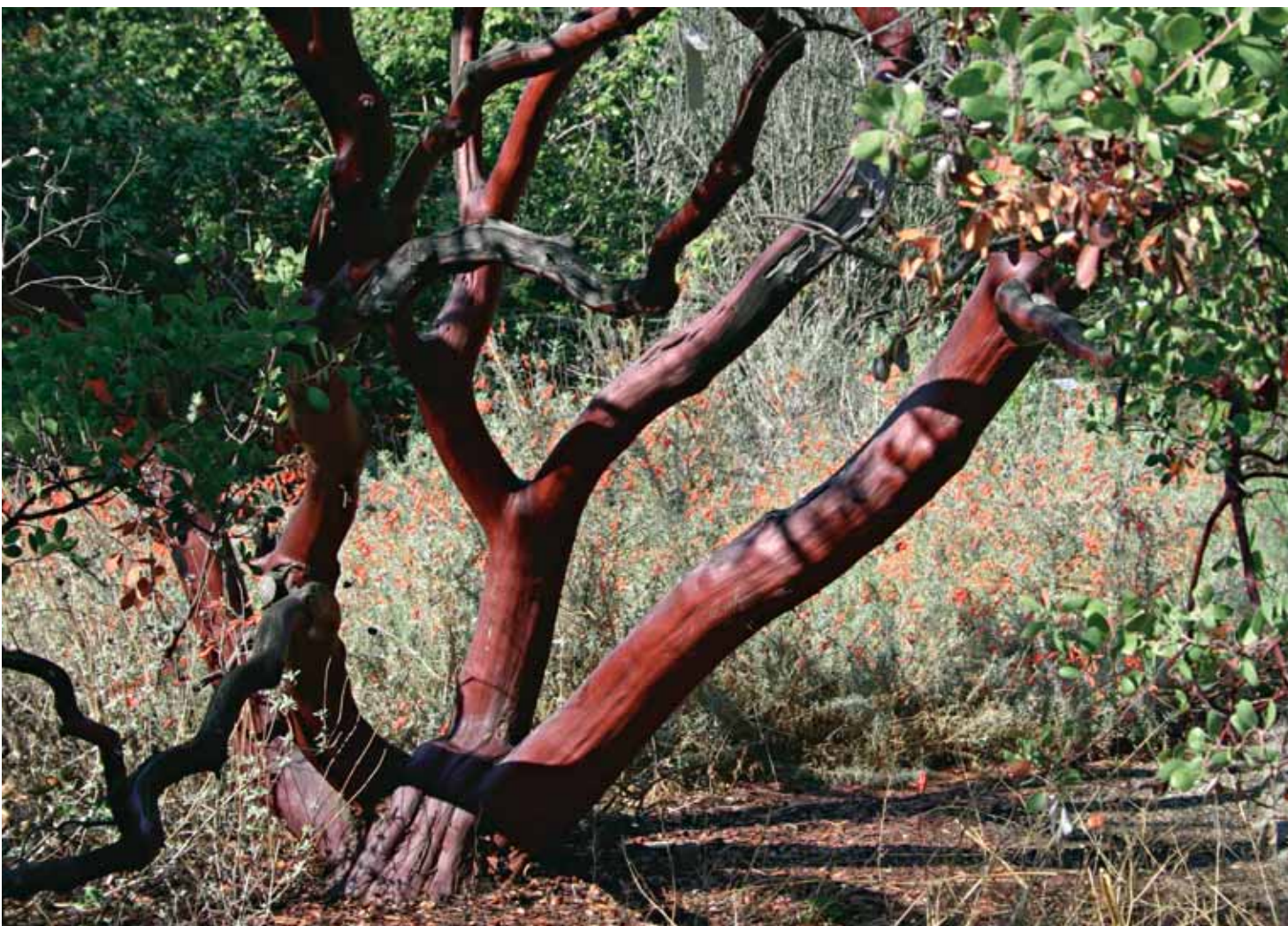
This bushy Mediterranean native with glossy green leaves produces pinkish white, grapelike bunches of flowers. These turn into clusters of edible but insipid fruits that resemble strawberries and vary in color from red to orange to yellow. Branches have peeling bark with a reddish hue, similar to manzanita. *Arbutus unedo* does well throughout the Southwest, from the desert to the seashore. 'Compacta' is a dwarf variety (to 10 feet).

Arctostaphylos manzanita (manzanita)

5 to 20 feet high; 4 to 10 feet wide

Manzanita is prized for its burgundy-colored bark and its tolerance for rocky soil. This California native is a slow-growing, woody shrub with leathery oval leaves. After flowering, it produces clusters of pea-sized red berries that resemble apples (*manzanita* is Spanish for little apple). Water infrequently and provide excellent drainage.

Arctostaphylos manzanita.
Rancho Santa Ana Botanical
Garden, Claremont, CA





Buddleja davidii bloom

Brahea armata (Mexican blue fan palm)

To 20 feet

This palm handles temperatures well below freezing and is drought-tolerant. The pale blue-gray color of its stiff fronds makes a perfect counterpoint to similarly colored succulents (such as *Agave americana*, *Senecio serpens*, and *Crassula arborescens*). For a striking combination, underplant it with *Festuca glauca*. Mexican blue fan palms are slow growing, but even small plants are worth having for their foliage.

Buddleja davidii (butterfly bush)

6 to 10 feet tall and as wide

Butterflies feed on the nectar of this plant's conical bloom spikes, which are densely packed with tiny flowers. Silvery leaves are slender and fuzzy. Most common flower colors are shades of purple, but hybrids also are available in yellow, magenta, white, and pink. Provide good drainage and just enough water, once established, to maintain growth. Plants become woody and overgrown, so prune in winter to reduce size and encourage lush spring growth.

Butia capitata (pindo palm, jelly palm)

To 20 feet

This vigorous, easy-to-grow tree has a rough gray trunk and long gray-green fronds that resemble arching feathers. Panicles of fragrant yellow or purplish flowers appear in spring, followed by clusters of fruit in summer. Edible pulp is used to make jelly and wine.



Butia capitata. Gary Mills garden, Encinitas. Design by Jeff Moore



Calliandra californica



Callistemon



Ceanothus

Caesalpinia

Size varies

These delicate trees and shrubs (formerly *Poinciana*) are legumes. Showy red and yellow flowers with conspicuous stamens are followed by ornamental pods. Does well in any hot, sunny location if growing in well-drained soil. Water infrequently and deeply. Frost tolerance varies by species.

Calliandra californica (Baja fairy duster)

5 to 6 feet high and as wide

Prized for its ferny foliage and red powder puff flowers, this airy shrub is tougher than it looks. It will get by on minimal water but thrives—and will bloom continuously—when given regular irrigation. Prune to shape. Native to Baja California.

Callistemon (bottlebrush)

Size varies; 20 feet or more

Bottlebrush, which needs little or no pruning, makes a good hedge and background plant dotted with color. Upward-arching shrubs and trees produce tufted red flowers that resemble spiky, cylindrical brushes. The common tree variety, *Callistemon citrinus*, grows rapidly to 20 or 30 feet, and dwarf varieties are available. *Callistemon viminalis* (weeping bottlebrush) has pendant branches. Flowers attract hummingbirds. Very drought-tolerant once established.

Cassia fistula (golden shower tree)

To 30 feet

Pendant branches of medium-green leaves produce showy yellow flower clusters from spring through autumn. This native of India does best in hot, dry locations. Seedpods follow flowers and can be messy. Prune when young to shape the tree and after flowering.

Ceanothus (California lilac)

Size varies depending on species

Entire hillsides in chaparral areas of California turn blue in late February and early March when the “wild lilac” blooms. Finely textured clusters of indigo, pale blue, or white flowers are fragrant and fragile. During the rest of the year, shrubs make good background plants. Do not irrigate or amend the soil (many cultivars prefer clay soil). *Ceanothus* does best when grown with other natives. Plants tend to be short-lived in cultivation; choose named varieties for best results.

Cercidium (palo verde)

25 to 30 feet

The common name means green bark in Spanish, which describes the tree's most distinctive characteristic. *Cercidium* is native to the Southwest and lower Colorado basin. Trees form a broad crown with densely massed branches that produce tiny yellow flowers in spring. *Cercidium* 'Desert Museum' is a hybrid of *C. floridum*, *C. microphyllum*, and *Parkinsonia aculeata*. It flowers profusely, is thornless, and produces minimal leaf litter. Good for desert gardens.

Chamelaucium uncinatum (geraldton waxflower)

6 to 8 feet

Large shrubs with an open growth habit have delicate, threadlike leaves and dainty, dime-sized, five-petalled flowers. These are rosy purple or pink and are grown commercially for floral arrangements. Plants thrive in full sun and prefer slightly alkaline, fast-draining soil. Cut back after bloom.

Chilopsis linearis (desert willow)

10 to 15 feet

Desert willow is native to the Southwest and northern Mexico. It is prized for showy trumpet-shaped flowers that grow on branch ends from late spring through summer, then leave behind long seedpods. Flower colors range from white to dark pink and lavender. These shrubby trees have an open growth habit, with rough-barked branches that twist at odd angles. Although its narrow, pointed leaves resemble those of many willows, *Chilopsis* is unrelated.

Cistus (rockrose)

Size depends on variety

Easy-care, evergreen shrubs are massed with crinkly, single-petalled white or pink flowers from spring into early summer, then bloom sporadically thereafter. Out of bloom, their gray-green foliage makes a pleasant, low-maintenance backdrop.

Citrus (orange, lemon, lime, grapefruit, and so on)

Size depends on variety

Citrus trees get by on surprisingly little water once established. They do best, however, with regular irrigation, seasonal applications of high-nitrogen fertilizer, and fast-draining soil. Summer heat enhances sweetness of fruit—which is useful, ornamental, and echoes in midwinter the orange of aloe blooms.

*Chilopsis linearis**Citrus**Cotoneaster*

Size varies

These ornamental shrubs and small trees are grown for their bright red berries, which provide cheerful color in autumn and winter. Use species with a dense, spreading habit on dry slopes for erosion control. They also make a good hedge. Prone to fire blight (a bacterial disease). Pruning may inhibit berry production.

Cycas revoluta (sago palm)

To 10 feet high and as wide

Sago palms are not actually palms—a different genus—but they provide a similar, tropical look of lushness. The cycad's overall shape echoes those of yuccas and agaves, while its stiff, glossy, dark green fronds provide an effective texture contrast to large, thick agaves. *Cycas revoluta* requires regular water (it is not drought-tolerant) and partial shade. Position prominently against a simple backdrop.



Echium candicans, agaves,
and yellow *Euryops*
pectinatus

Echium candicans (syn. *E. fastuosum*) (pride of Madeira)
5 to 6 feet tall; 6 to 10 feet wide

Few shrubs produce such magnificent conical flower spikes. These rise several feet above the plant and are massed with blue-purple tubular blooms. Leaves are gray-green and hairy; take care when pruning, as they can irritate skin. Grow in fast-draining soil and water sparingly. Suitable for beach gardens. Position against walls or sky to show flower clusters to advantage. Makes a good same-sized companion for large aloes and agaves. Deadhead after bloom, and prune to keep compact. Short-lived, but reseeds freely.

Eremophila maculata (spotted emu bush)
3 to 6 feet tall and as wide

This rounded shrub has finely textured, gray-green leaves and berrylike fruits that are eaten, in their native habitat, by emus (large Australian birds). Yellow, red, or pink tubular flowers have spotted throats and recurved (backward curving) petals. *Eremophila* 'Aurea' has golden-yellow, unspotted flowers; *E. maculata* 'Pink Beauty' has profuse pink flowers.

Erythrina (coral tree)
15 to 40 feet, depending on species

These trees are subtropical and therefore require moderate water; however, withhold irrigation in dry weather (once established) to prevent rapid growth that can lead to limb breakage. Coral trees can become huge, and their large roots—which grow along the surface of the ground—can be invasive, so select a location with care. They are prized for their brilliant, coral-red flowers, which are stunning in juxtaposition with the bloom spikes of aloes. Seeds are poisonous.

Euphorbia cotinifolia (Caribbean copper plant)
10 to 18 feet tall; 4 to 6 feet wide

Oval leaves range in hue from red-orange to purple on this deciduous tree, which can be pruned to stay shrub sized. Use it as a striking backdrop for blue-gray or orange-leaved succulents, such as blue *Agave attenuata* 'Boutin Blue' or *Euphorbia tirucalli* 'Sticks on Fire'. New plants can be started from cuttings (trimmed branches). *Euphorbia cotinifolia* will not tolerate frost and may suffer dieback when temperatures drop into the mid-40s; position against a wall or boulder that absorbs sun during the day and radiates heat at night.



Erythrina



Euryops pectinatus



Grevillea

Euryops pectinatus (freeway daisy)

3 to 6 feet tall and as wide

These low-maintenance shrubs are used to landscape highway borders and bloom prolifically early spring through summer. Though common, they serve admirably as filler, screen, or background plants. Foliage is gray-green and finely divided; flowers resemble bright yellow daisies. Good for beach gardens.

Ficus carica (edible fig)

15 to 30 feet

Fig trees that bear edible fruit tend to have an open, spreading branch structure. Leaves are large and coarse, and bark is pale gray. Although they look tropical, mature fig trees need no frost protection above 20°F. Trees bear two crops a year (a small one in spring and a larger one in autumn) and are not picky about soil, providing it drains well. Plant bare-root fig trees in winter, in a sunny location. Fruiting begins after three years.

Grevillea

6 to 12 feet

Most of the numerous *Grevillea* cultivars have fine-textured leaves and waxy flowers that resemble those of bottlebrush. These are born in clusters and are hummingbird magnets. Plants get by with minimal water once established, but like other Proteaceae, they are finicky about soil. Give coarse, fast-draining soil free of salt build-up and low in phosphorus (check fertilizer label before applying). Makes a good hedge shrub or backdrop plant.

Lagerstroemia indica (crape myrtle)

25 feet

This deciduous tree has a pleasant, open growth habit. In summer, it produces frothy clusters of dainty flowers that range from pink to deep red. Small, oval leaves provide dependable autumn color, and smooth beige bark offers winter interest. An excellent tree for hot summers in the Southwest, it may be prone to mildew in colder, wetter climates. Prune when dormant to enhance the following year's flower show. Very slow growing.

Lantana montevidensis (lantana)

2 feet high, with branches trailing several feet

Tiny flowers in ball-shaped clusters come in combinations that range from red-orange-yellow to purple-yellow-pink. Leaves are small, glossy, and dark green. Plants get woody, so trim back hard before spring growth begins. Lantana makes an excellent bank cover and contrasts effectively with yuccas, agaves, and furcraea. Protect from frost.

Lavatera maritima (syn. *L. bicolor*) (tree mallow)

6 to 8 feet tall; 4 feet wide

These fast-growing, flowering shrubs have an airy silhouette. Flowers resemble single hollyhocks, with petals that are satiny purple-pink and heart-shaped, with a deeper magenta at the centers. Gray-green leaves are shaped like those of maples. Shrubs tend to be short-lived (two to four years). Give full sun and prune back in autumn. New plants start readily from cuttings. Striking when planted alongside a spring-blooming ice plant in the same hue, such as *Drosanthemum floribundum*.

*Lagerstroemia indica**Lavatera maritima*



Melaleuca quinquenervia. Design by owner Patrick Anderson



Nandina domestica. Rancho La Puerta



Nerium oleander

Leptospermum scoparium (New Zealand tea tree)

8 to 10 feet

Upright shrubs are an airy mass of slender, mostly vertical branches covered with small, prickly leaves and dime-sized white, pink, or red flowers with crinkly petals. Makes a good hedge or background plant and offers floral color much of the year. Little or no pruning needed.

Melaleuca

Size varies (12 feet or more)

Though more than 100 species of these Australian trees exist, only a dozen or so are available in commercial nurseries. Leaves are leathery and small; flowers are generally cream-colored and resemble those of bottlebrush (*Callistemon*). Clusters of beadlike seed pods persist on branches for several years. Most varieties of *Melaleuca* have weeping branches and corky bark that peels off in sheets. Some are too messy for succulent gardens; one good choice is *M. nesophila* (pink melaleuca), which grows large and sprawling, but with pruning can be shaped into an attractive small tree.

Myrtus communis (myrtle)

Size varies

These evergreen shrubs with dense, fine-textured leaves make good hedges and backdrop plants that are drought-tolerant when established. Foliage is fragrant and makes a good filler for floral arrangements. Varieties range from dwarf 'Compacta' to boxwood-like 'Buxifolia', but arguably the most attractive is 'Variegata', which has white-edged leaves.

Nandina domestica (heavenly bamboo)

6 to 8 feet tall; 3 to 4 feet wide

The thumbnail-sized oval leaves of these delicately textured shrubs turn from chartreuse to rich shades of orange and red in autumn. Creamy white flowers become grapelike clusters of pea-sized red berries; use them in cut arrangements. In hottest climates, grow heavenly bamboo in dappled shade. It is lovely when combined with variegated agaves and *furcraea*.

Nerium oleander (oleander)

Size varies

Cultivars range in size from shrubs that are 4 feet tall and about the same diameter to upwards of 12 feet. Large white- and pink-flowering varieties (such as those that grow in freeway medians for miles along California highways) make good hedges. Use smaller cultivars in dry gardens to provide lush foliage and dependable color. Plants should be sheared back after summer bloom to keep them compact. All parts of the plant are poisonous.

Olea europaea (olive tree)

30 feet

Olive trees have been cultivated for centuries for their oil-producing fruit; silvery, willowy foliage; and beautifully gnarled limbs. They harken to the Mediterranean, where they originate, but are widely cultivated elsewhere. One drawback is that the fruit stains sidewalks and driveways, but sprays that inhibit fruiting are available. Well-irrigated young trees can grow 5 to 6 feet a year.

Perovskia 'Blue Spire' (Russian sage)

4 to 5 feet

Airy panicles of fuzzy, lavender-blue flowers align themselves along slender stems above loosely branched shrubs that have narrow, gray-green leaves. Plants bloom repeatedly from spring through autumn if deadheaded. Cut Russian sage to the ground in winter or it will get leggy. Tolerates poor soil, heat, frost, and drought.

Pithecellobium flexicaule (Texas ebony)

15 to 30 feet tall; 15 to 20 feet wide

These graceful desert trees have zigzagging branches and finely textured, deep green leaves. Flowers that resemble cotton puffs turn into dark brown seed pods. Texas ebony tolerates remarkably difficult growing conditions: searing desert heat, cold to 10°F, and drought. Trees are thorny and slow-growing. Deep water bimonthly in summer.

Prosopis (mesquite)

Up to 30 feet tall and as wide

Mesquite trees are especially useful in desert regions, where they provide welcome shade for patios and garden beds. Deciduous compound leaves are made up of many tiny leaflets, lending a delicate look to the tree. Stems are spiny, often viciously so, but thornless varieties are available. Fluffy spikes of yellow flowers appear in spring. Trees will survive on minimal water, but they thrive with ample irrigation. Roots will invade sewer and drainage lines.

Punica granatum (pomegranate)

15 to 20 feet tall and as wide

Fruit production of these shrubby, drought-tolerant trees is enhanced by regular watering. Bright orange-red spring blossoms are followed in fall by softball-sized red fruit filled with seed sacks that resemble rubies. Autumn leaves turn bright yellow and drop. Prune during winter dormancy. Plant nasturtiums or a red-blooming ice plant at the base of a pomegranate tree to repeat the color of its blossoms in spring.



Pithecellobium flexicaule



Punica granatum



Salvia gesneriiflora 'Tequila'

Rosmarinus officinalis (rosemary)

Size varies

This widely grown, woody herb has finely textured, dark green leaves, sprawling stems, and small blue flowers. Prune regularly to encourage new growth and keep compact. Numerous hybrids include popular 'Blue Spires', which grows 5 to 6 feet tall. Suitable for beach gardens.

Salvia (sage)

Size varies

This largest genus of the mint family includes 900 species. Due to surging popularity, dozens of ornamental varieties are available in nurseries. Among those best suited to succulent gardens are *Salvia aurea* (African sage), which has rust-brown flowers; *S. greggii* (autumn sage), with floral colors ranging from deep magenta through shades of rose, pink, and white; and purple-flowered *S. leucantha* (Mexican bush sage). *Salvia gesneriiflora* is striking in combination with large agaves and furcraeas; it grows to 8 feet tall and has brilliant orange-red blooms. Though more drought-tolerant than many perennials, most salvias come from areas of summer rainfall and do best with regular deep watering. Shrubs tend to be delicate and airy; prune after flowering to maintain shape.

Schinus molle (California pepper)

25 to 40 feet

This graceful tree has pendulous branches covered with slender leaves. It is native to Peru but grows literally like a weed in California. Female trees produce clusters of red seed pods. Roots are invasive and leaf litter copious, but *Schinus molle* will thrive in areas of the garden where nothing else will grow. Use as a background tree, and do not attempt to cultivate succulents beneath the leaf canopy. In all but desert areas, mature pepper trees can get by on rainfall alone. Moderately frost-hardy once established.

Senna artemisioides (syn. *Cassia artemisioides*) (feathery cassia)

3 to 5 feet tall and as wide

This wispy desert shrub tolerates drought but looks best if watered. Cloud-like clusters of bright yellow flowers in winter and spring are followed by dark brown, delicate, ornamental seed pods. Use *Senna artemisioides* as a background plant, hedge, or screen. Trim in autumn to maintain compact growth. *Senna*



Senna artemisioides with *Agave americana*.
Rancho La Puerta



Tagetes lemmonii. Design by owners Don and Jill Young and
landscape architect Jeffrey Rule

nemophila (desert cassia) looks similar but has green instead of gray foliage and greater cold tolerance.

Sphaeralcea ambigua (apricot mallow)

3 to 4 feet tall; 2 to 3 feet wide

Apricot mallow is a woody desert shrub that does best when given minimal water; it will not tolerate wet winters. Delicate orange flowers that resemble hollyhocks contrast beautifully with round, gray-green leaves. Grow it in combination with other plants native to Mexico and the Southwest, which promote a symbiotic community of beneficial soil organisms.

Tagetes lemmonii (Copper Canyon daisy, bush marigold)

3 to 6 feet tall and as wide

Delicate, gray-green foliage is pleasantly aromatic, so position shrubs where passersby will brush against them. Brilliant golden yellow flowers appear from autumn through spring. Plants are somewhat brittle and have a lacy growth habit. Give full sun, with shelter from frost and gusty winds. Cut back in summer.

Tecoma

15 to 30 feet

This genus includes small trees and evergreen shrubs that are prized for their glossy green leaves and brilliantly colored flowers. *Tecoma stans* (syn. *Stenolobium stans*, 15 to 20 feet), commonly called yellow bells, has bright yellow, trumpet-shaped flowers arranged in sprays at branch tips. Bloom is summer through autumn. Although a good choice for desert gardens, *T. stans* appreciates summer irrigation. Protect from frost.

Ornamental Grasses*Festuca glauca* (common blue fescue)

12 inches tall; 10 inches wide

Use this frost-hardy ornamental grass, which forms dense tufts of threadlike, silvery blue leaves, to provide soft mounds beneath spiky agaves and to echo their blue-gray color. Blue fescue also is striking in contrast with red-leaved plants and those with orange flowers. Divide clumps in autumn.

*Nassella tenuissima**Nassella tenuissima* (syn. *Stipa tenuissima*)

(Mexican feather grass)

2 feet tall; 2 to 3 feet wide

This billowy ornamental grass offers dramatic textural contrast to hefty aloes and agaves. Slender, feathery stems create a silver-green cloud that ripples in the slightest breeze. Cut back close to the ground in winter to make way for fresh spring growth. Will self-sow once established, to the point of being invasive.

Pennisetum setaceum 'Rubrum'

(purple fountain grass)

To 5 feet tall and as wide

Planted solo or in multiples, this cultivar with bronze leaves and feathery purple-red flower plumes is among the most striking of ornamental grasses. It flowers summer through autumn and should be cut to the ground in winter. 'Rubrum' does not self-sow as much as the species, and it gets by on minimal water once established.

Pennisetum setaceum 'Rubrum'





Vining Plants

Bougainvillea

15 to 30 feet

Bougainvillea's papery bracts come in brilliant colors—red, purple, orange, pink, golden yellow, and white—and its spreading, mounding form enhances walls, archways, pergolas, slopes, terraces, and fences. Cultivars with variegated leaves are available. Take care when planting that you do not disturb its delicate roots. Bougainvillea makes a gorgeous backdrop for large succulents, particularly blue agaves. Red and orange varieties effectively echo the winter blooms of aloes. Bougainvillea thrives on heat and is drought-tolerant once established. Protect from frost.

Gelsemium sempervirens (Carolina jessamine)

20 feet

Fragrant, bright yellow, trumpet-shaped blooms appear in spring and again in autumn, and may last into winter. Vines are lovely trained over arbors or cascading down walls. When the interior of the plant gets woody, cut back severely.

Rosa banksiae (Lady Banks' rose)

20 feet

Of all the roses, this is perhaps the best suited to a dry garden. In early spring, a profusion of marble-sized, multi-petalled flowers appear in clusters on thornless stems. Blooms can be either white or pale yellow, depending on the variety. When the shrub sends out long (sometimes 15-foot) canes in summer, trim or train along a fence or arbor.

Tecoma capensis (syn. *Tecomaria capensis*) (cape honeysuckle)

15 to 30 feet

Cape honeysuckle can be grown as a shrub, if pruned, or allowed to blanket a fence or wall. Clusters of orange trumpet-shaped flowers appear autumn through spring.

Tecoma capensis



Resources

For a comprehensive international directory of succulent nurseries, organizations, and public installations, visit the Internet site “Cactus and Succulent Plant Mall,” at www.cactus-mall.com. For resources specific to your area, contact your local chapter of the Cactus and Succulent Society of America (CSSA, www.cssainc.org). The CSSA offers a wealth of information, and at meetings you can view and obtain collectible specimens.

Before visiting any nursery, call ahead or peruse the business’s website for hours of operation and to learn its specialty. If no street address is provided, chances are the owners either require an appointment or sell primarily via mail-order. Succulent and cactus nurseries also do a thriving business via eBay (www.ebay.com).

Gardens open to the public that include cacti and succulents in their collections offer opportunities to see the plants in landscape applications as well as mature and unusual specimens. Several gardens well worth visiting are listed here. Moreover, many colleges and universities—particularly University of California campuses at Berkeley, Davis, Irvine, Riverside, and Santa Cruz—also have impressive collections. Before visiting, call first or check the locale’s website for hours, which may vary seasonally. You also might want to time your visit to take advantage of occasional plant sales.

The Arizona-Sonora Desert Museum
2021 North Kinney Road
Tucson, AZ 85743
(520) 883-2702
www.desertmuseum.org

Boyce Thompson Arboretum
37613 Highway 60
Superior, AZ 85273
(520) 689-2811
<http://arboretum.ag.arizona.edu>

Denver Botanic Gardens
1005 York Street
Denver, CO 80206
(720) 865-3500
<http://denverbotanicgardens.org>

Desert Botanical Garden
1201 North Galvin Parkway
Phoenix, AZ 85008
(480) 941-1225
www.dbg.org

The Gardens at the Las Vegas Springs Preserve
(formerly Desert Demonstration Gardens)
3701 West Alta Drive
Las Vegas, NV 89153
(702) 258-3205
www.lvspgardens.org

J. Paul Getty Museum
1200 Getty Center Drive
Los Angeles, CA 90049
(310) 440-7300
www.getty.edu/museum/

Huntington Botanical Gardens
1151 Oxford Road
San Marino, CA 91108
(626) 405-2100
www.huntington.org

The Living Desert
47900 Portola Avenue
Palm Desert, CA 92260
(760) 346-5694
www.livingdesert.org

Los Angeles County Arboretum & Botanic Garden
301 North Baldwin Avenue
Arcadia, CA 91007
(626) 821-3222
www.arboretum.org

Lotusland
695 Ashley Road
Santa Barbara, CA 93108
(805) 969-9990
www.lotusland.org

Peckerwood Garden
20571 F.M. 359
Hempstead, TX 77445
(979) 826-3232
www.peckerwoodgarden.com

Quail Botanical Gardens
230 Quail Gardens Drive
Encinitas, CA 92024
(760) 436-3036
www.qbgardens.org

Rancho Santa Ana Botanic Garden
1500 North College Avenue
Claremont, CA 91711
(909) 625-8767
www.rsabg.org

The Ruth Bancroft Garden
1500 Bancroft Road
Walnut Creek, CA 94598
(925) 210-9663
www.ruthbancroftgarden.org

San Francisco Botanical Garden
9th Avenue at Lincoln Way
San Francisco, CA 94122
(415) 661-1316
www.sfbotanicalgarden.org

Santa Barbara Botanic Garden
1212 Mission Canyon Road
Santa Barbara, CA 93105
(805) 682-4726
www.sbbg.org

Sherman Library and Gardens
2647 East Coast Highway
Corona Del Mar, CA 92625
(949) 673-2261
www.slgardens.org

Tucson Botanical Gardens
2150 North Alvernon Way
Tucson, AZ 85712
(520) 326-9686
www.tucsonbotanical.org

H. Warren Buckner Cactus and Succulent Garden
Water Conservation Garden
12122 Cuyamaca College Drive West
El Cajon, CA 92019
(619) 660-0614
www.thegarden.org

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Index

Pages in *italic* include photographs.

- Abutilon palmeri*, 80, 223
Acacia, 29, 223
Achillea millefolium, 214
Aeonium arboreum, 11, 51, 54, 55, 112, 166, 221
Aeonium arboreum ‘Zwartkop’, 28, 51, 52, 58, 59, 60, 63, 107, 112, 117, 137, 166–167, 187, 211, 221
Aeonium canariense, 58, 72, 98, 167
Aeonium ‘Cyclops’, 166
Aeonium haworthii, 11, 44, 52, 60, 113, 141, 167, 173
Aeonium ‘Kiwī’, 50, 103, 109, 167
Aeonium ‘Sunburst’, 50, 60, 95, 98, 139, 167
Aeonium tabuliforme, 102
Aeonium undulatum, 166
African daisies. See *Gazania* hybrids
Agapanthus orientalis, 214
Agave americana, 42, 44, 52, 61, 79, 82, 142, 148–150, 149, 208, 219, 220, 225, 239
Agave americana ‘Marginata’, 11, 20, 41, 50, 72, 142, 149
Agave americana ‘Mediopicta Alba’, 16, 168–169
Agave angustifolia, 50, 68, 73, 104, 160, 168–169
Agave attenuata, 13, 20, 20, 39, 40, 58, 74, 82, 83, 98, 105, 122, 169, 188, 231
Agave attenuata ‘Boutin Blue’, 52, 169, 231
Agave attenuata ‘Variegata’, 48, 50, 169–170
Agave ‘Blue Flame’, 52, 168
Agave bracteosa, 171, 178
Agave desmettiana, 35, 50, 51, 89, 98, 169
Agave filifera, 171
Agave franzosinii, 52, 58, 150
Agave guadalajarana, 171
Agave guiengola, 73, 134, 150, 217
Agave gypsophila, 52, 170, 171
Agave macroculmis, 171
Agave parryi, 25, 53, 94, 118, 125, 152, 155, 169, 171
Agave potatorum, 163, 171
Agave schidigera, 170, 171
Agave ‘Sharkskin’, 171
Agave shawii, 170, 171
Agave stricta, 157, 171
Agave tequilana, 26
Agave victoriae-reginae, 94, 169, 171
Agave vilmoriniana, 87, 89, 104, 171
Agave weberi, 160
Allard, Jo Ann, garden, 167
Alluaudia, 27, 77, 85, 151
Aloe arborescens, 38, 42, 45, 50, 55, 82, 83, 172–173, 190, 223
Aloe aristata, 187
Aloe bainesii. See *Aloe barberae*
Aloe barbadensis, 49, 172
Aloe barberae, 27, 81, 82, 146, 152–153, 158
Aloe brevifolia, 49, 50, 52, 186, 196
Aloe buhrii, 31
Aloe cameronii, 38, 46, 49, 50, 63, 70, 144, 172, 173
Aloe ‘David Verity’, 73
Aloe dichotoma, 38, 40, 153, 158
Aloe distans, 187
Aloe dorotheae, 46
Aloe elegans, 52, 173
Aloe elgonica, 46, 50, 144, 173
Aloe ferox, 26, 27, 55, 152, 153–154
Aloe gracilis, 188
Aloe ‘Hercules’, 38, 153
Aloe marlothii, 26, 29, 52, 55, 73, 153, 163
Aloe nobilis, 44, 49, 50, 51, 106, 186, 187
Aloe plicatilis, 12, 32, 52, 61, 153, 154
Aloe polyphylla, 125–126
Aloe rubroviolacea, 51, 94, 173
Aloe saponaria, 142, 186, 198
Aloe speciosa, 54, 55, 73, 173

- Aloe striata*, 13, 35, 41, 53, 55, 71, 72, 72, 89, 173
Aloe thraskii, 38, 77, 82, 154
Aloe vanbalenii, 10, 38, 50, 105, 173, 178
Aloe vaombe, 51, 55, 56, 89, 173
Aloe variegata, 187
 aloe vera. See *Aloe barbadensis*
Alyogyne huegelii, 223
Amaryllis belladonna, 211–212
 Anderson, Patrick, garden and design, 9, 10, 26, 60, 61, 70, 73, 98, 234
Anigozanthos, 104, 214, 214
Aporocactus flagelliformis, 76, 86, 87, 101
 Applebaum, Suzanne, garden and design, 45
 apricot mallow. See *Sphaeralcea ambigua*
Aptenia cordifolia, 160, 187
Arbutus unedo, 224
Arctostaphylos manzanita, 224
 Arizona-Sonora Desert Museum, Tucson, 22, 244
Artemisia, 58, 214
 art gallery garden, 73–75
 Athens, Karen, mural, 86

Babiana stricta, 211
 baboon flower. See *Babiana stricta*
 Bailey, Peter, garden and design, 13, 88, 149
 Baja fairy duster. See *Calliandra californica*
 Baker, Barbara, design, 63, 95
 Baldwin, Debra Lee, garden and design, 43, 72
 beach and seaside gardens, 66, 82, 83, 172, 187, 188, 218, 222, 230, 232, 238
Beaucarnea, 101, 154
 belladonna lily. See *Amaryllis belladonna*
Beschorneria, 150–151
 bird of paradise. See *Strelitzia reginae*
 blanket flower. See *Gaillardia × grandiflora*
 blue fescue. See *Festuca glauca*
 blue hibiscus. See *Alyogyne huegelii*
 blue senecio. See *Senecio mandraliscae*, *Senecio serpens*
 bonsai, 175, 182
 bottlebrush. See *Callistemon*
 bottle palm. See *Beaucarnea*
Bougainvillea, 12, 42, 59, 104, 149, 169, 206, 208, 214, 220, 243

Bowiea volubilis, 188, 188
 Boyce Thompson Arboretum, Arizona, 244
Brahea armata, 225
 Brightwood, Sara Livia. See Rancho La Puerta
 brittle bush. See *Encelia farinosa*
Bryophyllum, 132, 142, 143, 180–181
 Buckner, Joyce, design, 62
 Buckner, Michael, The Plant Man nursery, design, 16, 35, 36, 37, 40, 48, 51, 58, 74, 75, 166, 168, 172, 187
Buddleja davidii, 225
Bulbine frutescens, 11, 13, 55, 67, 71, 140, 173
 burro tail. See *Sedum morganianum*
 bush marigold. See *Tagetes lemmonii*
Butia capitata, 225, 225
 butterfly bush. See *Buddleja davidii*
 Byrne, Janice, garden, 27, 105

 Cactaceae, 76–78, 155–156
 Cactus and Succulent Society of America (CSSA), 22
Caesalpinia, 227
Calandrinia grandiflora, 55, 59, 67, 174
 California Cactus Center nursery, design, 62, 63, 95, 96, 102, 106, 108, 109
 California fuchsia. See *Zauschneria californica*
 California lilac. See *Ceanothus*
 California pepper tree. See *Schinus molle*
 California poppy. See *Eschscholzia californica*
Calliandra californica, 226, 227
Callistemon, 226, 227
 candle plant. See *Senecio articulatus*
 cape honeysuckle. See *Tecoma capensis*
 Caribbean copper plant. See *Euphorbia cotinifolia*
Carissa macrocarpa, 82
 Carnegie Mellon University, garden, 69
 Carolina jessamine. See *Gelsemium sempervirens*
Carpobrotus, 82, 188–189
 carrion plant. See *Stapelia*
 Casanova, Judy, Desert Succulent Creations, design, 53, 61, 222
Cassia artemisioides. See *Senna*
Cassia fistula, 227
 Catlin, Jack, 167
 Cave, Yvonne, 157
Ceanothus, 226, 227

- Centranthus ruber*, 214, 215
 century plant. See *Agave americana*
Cephalocereus senilis, 76
Cercidium, 80, 228
Cereus, 64, 76, 155
Cereus peruvianus, 13, 76
Ceropegia woodii, 206
Chamelaucium uncinatum, 228
Chilopsis linearis, 80, 228, 229
 cholla. See *Opuntia*
 Christmas cactus. See *Schlumbergera*
Cistus, 228
Citrus, 228, 229
Cleistocactus strausii, 76
 Clements, Joe, design, 30, 78, 79
 Clifton, Scott and Mary, Rosecroft, garden and design, 196
 cobweb houseleek. See *Sempervivum arachnoideum*
 colored walls, 27, 29, 61, 99
 Connable, Laurie, design, 60
 Copper Canyon daisy. See *Tagetes lemmonii*
 coral aloe. See *Aloe striata*
 coral tree. See *Erythrina*
Coreopsis, 215
Cotoneaster, 229
Cotyledon orbiculata, 27, 52, 67, 175
Cotyledon tomentosa, 189, 189
 crape myrtle. See *Lagerstroemia indica*
Crassula arborescens, 25, 53, 153, 175, 176, 225
Crassula capitella, 191
Crassula coccinea 'Campfire', 28, 44, 50, 80, 113, 117, 136, 189, 190
Crassula falcata, 52, 55, 56, 86, 149, 175
Crassula multicava, 143, 189, 190
Crassula muscosa, 109, 191
Crassula ovata, 59, 82, 113, 115, 175, 176
Crassula ovata 'Gollum', 97, 177
Crassula ovata 'Hummel's Sunset', 50, 51, 80, 81, 175
Crassula perforata, 50, 94, 113, 189–190, 191
Crassula pubescens, 23, 49, 50, 191
Crassula pyramidalis, 191
Crassula tetragona, 97, 100, 176, 177
Crocasmia ×crocosmiiflora, 212
 Crow, Sheryl, garden, 45
 crown of thorns. See *Euphorbia milii*
Cycas revoluta, 229
Cyphostemma juttae, 156

Dasyilirion, 24, 31, 53, 148, 157
 daylily. See *Heemerocallis*
 Dean, Robert, design, 18, 25
 decollate snails, 138
Delosperma, 55, 57, 126, 199
 Denver Botanic Gardens, 244
 Desert Botanical Garden, Phoenix, 244
 desert gardens, 11, 20, 23, 64, 75, 76–80, 77–79, 81, 84, 111, 151, 155, 156, 183, 210, 240
 desert willow. See *Chilopsis linearis*
Dietes bicolor, 82, 215
 dormancy, 23, 111, 125, 134, 140, 156, 166
 Douglas, Christina, garden and design, 52, 70, 71, 190
Dracaena draco, 82, 99, 146, 158, 159
Dracaena marginata, 26, 89, 158
 dragon tree. See *Dracaena draco*
Drosanthemum, 55, 57, 81, 100
Drosanthemum floribundum, 42, 113, 157, 173, 199, 211, 233
 dry creek bed, 33, 34
Dudleya, 52, 192
 dusty miller. See *Senecio cineraria*
Dyckia, 30, 87
 Dykema, Carl, Exotic Gardens nursery, design, 157
Dymondia margaretae, 72, 169, 213

Echeveria, ruffled, 12, 143, 194
Echeveria agavoides, 50, 194
Echeveria imbricata, 31, 71, 194
Echeveria pallida, 71
Echeveria pulvinata, 51, 193, 194
Echinocactus grusonii, 38, 46, 76, 77, 78, 79, 88, 134, 144, 206
Echinocereus, 76, 125
Echium candicans, 13, 82, 230, 230
 Ecosystems Imagery, design, 31, 217
 Effron, Mary, garden and design, 92
 elephant's food. See *Portulacaria afra*
 Elfin Forest Firesafe Demonstration Garden, 66, 67
 emu bush. See *Eremophila maculata*

- Encelia farinosa*, 80, 216
Eremophila maculata, 231
Erigeron karvinskianus, 149, 216
Erythrina, 26, 231
Eschscholzia californica, 67, 199, 210, 211
Euphorbia ammak, 35
Euphorbia caput-medusae, 87, 95, 195
Euphorbia characias, 179
Euphorbia cooperi, 31
Euphorbia cotinifolia, 35, 231
Euphorbia flanaganii, 87, 195
Euphorbia horrida, 52, 87, 179
Euphorbia ingens, 33, 40, 41, 105, 152, 158, 159
Euphorbia lactea, 179
Euphorbia leucodendron, 87
Euphorbia milii, 33, 55, 56, 58, 149, 152, 157, 178–179, 187, 206
Euphorbia obesa, 87
Euphorbia polygona, 87, 178, 179
Euphorbia resinifera, 29, 178, 195
Euphorbia rigida, 10, 178, 179
Euphorbia stenoclada, 53, 178
Euphorbia tirucalli, 29, 66, 177, 178
Euphorbia tirucalli 'Sticks on Fire', 16, 27, 38, 49, 50, 58, 86, 87, 97, 168, 177, 178, 231
Euphorbia trigona, 50, 101, 158, 179
Euryops pectinatus, 82, 230, 232

Favel, Phil, garden and design, 153
Feltman, Richard, garden and design, 44, 53, 157, 199
Ferocactus, 76
fertilizer, 110–111, 116–117, 124
Festuca glauca, 25, 27, 35, 104, 149, 167, 211, 225, 240
Ficus carica, 232
Filanc, Francesca, garden and design, 103, 174
fire-safe garden, 66, 67, 68, 229
flapjack plant. See *Kalanchoe luciae*
fortnight lily. See *Diets bicolor*
Fouquieria splendens, 77, 79
freeway daisy. See *Euryops pectinatus*
frost protection, 120–125
Furcraea, 50, 160, 183

Gaillardia × *grandiflora*, 51, 216
Gardens at the Las Vegas Springs Preserve, NV, 244
Gasteria, 196, 197
Gazania hybrids, 177, 217
Gelsemium sempervirens, 242, 243
geometric plantings, 72, 88–90, 88, 89, 108, 108
geraldton waxflower. See *Chamelaucium uncinatum*
Getty, J. Paul, Museum, Los Angeles, 244
Glottiphyllum, 189
golden ball cactus. See *Parodia*
golden barrel cactus. See *Echinocactus grusonii*
golden shower tree. See *Cassia fistula*
Goldstein, Jon, Jonny Appleseed Landscape, design, 45
Goodwin, Nancy, garden, 127
Graptopetalum, 52, 53, 100, 190, 196, 197
Graptoveria, 48, 49, 51, 72, 197
grasses, ornamental, 21, 27, 28, 34, 39, 89, 240, 240, 241
greenhouse culture, 120–121, 124
green roofs, 68–69
Grevillea, 233

Haden, Paul, The Collaborative West, design, 42
Hampton, Diane and Mark, garden and design, 35
hanging baskets, 86, 100, 130, 181, 186, 201, 203, 206, 216, 220
harlequin flower. See *Sparaxis tricolor*
Haworthia, 44, 97, 113, 143, 196, 197
heavenly bamboo. See *Nandina domestica*
Hechtia, 53, 98
hedgehog cactus. See *Echinocereus*
Hemerocallis, 217
hen and chicks. See *Sempervivum*
Henderson, Marylyn, 143
Hesperaloe, 30, 151
Hill, Stephen, garden, 26
hillside plantings, 13, 43, 45, 81
Hirschkoff, Bobbi, garden and design, 41, 68
Hobbs, Thomas, garden and design, 13, 32, 124, 168
houseleek. See *Sempervivum*
Hoya, 33, 196, 197

- Huntington Botanical Gardens, San Marino, CA, 22,
30, 71, 78, 79, 81, 140, 167, 192, 245
- Huntzinger, Paul, garden, 31, 217
- ice plant, 34, 41, 42, 45, 54, 105, 126, 198, 199
- Indian mallow. See *Abutilon palmeri*
- Innisfree Garden, 121
- Irish, Mary and Gary, 163
- ivy geranium. See *Pelargonium peltatum*
- jade plant. See *Crassula ovata*
- Jansons, Ilga and Dryfoos, Michael, garden and
design, 129
- Johnston, Russ. See SJA Inc.
- Jovibarba, 130, 131
- Jupiter's beard. See *Centranthus ruber*
- Kalanchoe beharensis*, 35, 53, 161, 161
- Kalanchoe blossfeldiana*, 28, 29, 54, 55, 56, 62, 94, 103,
180
- Kalanchoe daigremontiana*, 180
- Kalanchoe fedtschenkoi*, 53, 181
- Kalanchoe luciae*, 26, 31, 48, 50, 52, 67, 80, 87, 136,
169, 180, 181, 218
- Kalanchoe marmorata*, 53, 164, 181
- Kalanchoe marnieriana*, 55
- Kalanchoe orgyalis*, 53, 70, 181
- Kalanchoe pumila*, 53, 62, 113, 181
- Kalanchoe thyrsiflora*, 181
- Kalanchoe tomentosa*, 53, 179, 180
- Kalanchoe uniflora*, 18, 166, 180, 181
- kangaroo paw. See *Anigozanthos*
- Kaszas, Patricia, mosaic, 75
- kitten paws. See *Cotyledon tomentosa*
- Koby's Garden Alchemy, design, 167
- labyrinth garden, 90, 91
- Lady Banks' rose. See *Rosa banksiae*
- Lagerstroemia indica*, 233
- Lampranthus*, 55, 57, 100, 199
- Landcraft Environments, Ltd., garden and design,
98
- Lantana montevidensis*, 82, 233
- Lavandula*, 218
- Lavatera maritima*, 233
- lavender. See *Lavandula*
- lavender cotton. See *Santolina chamaecyparissus*
- Leonotis leonurus*, 218
- Leptospermum scoparium*, 235
- Leucophyllum frutescens*, 80
- Lewisia*, 126, 127
- lily of the Nile. See *Agapanthus orientalis*
- Lima, Amelia, design, 20, 59
- Limonium perezii*, 218, 219
- lion's tail. See *Leonotis leonurus*
- Lithops*, 200
- The Living Desert, Palm Desert, CA, 245
- living stones. See *Lithops*
- Longdyke, Robert, garden and design, 211
- Longwood Gardens, garden, 128
- Los Angeles County Arboretum and Botanic Gar-
den, 245
- Lotusland, Santa Barbara, CA, 158, 245
- Madagascar ocotillo. See *Alluaudia*
- Madagascar palm. See *Pachypodium*
- mallow. See *Lavatera maritima*
- Mammillaria*, 77, 80, 125
- manzanita. See *Arctostaphylos manzanita*
- matilija poppy. See *Romneya coulteri*
- McNeal, Rogue design, 101, 178
- Medusa plant. See *Euphorbia flanaganii*, *Euphorbia*
caput-medusae
- Melaleuca*, 29, 234, 235
- Mesembryanthemum*. See ice plant
- Mexican blue fan palm. See *Brahea armata*
- Mexican daisy. See *Erigeron karvinskianus*
- Mexican evening primrose. See *Oenothera speciosa*
- Mexican feather grass. See *Nassella tenuissima*
- Miller, Clint, garden and design, 79
- Mills, Gary, garden, 225
- Mimulus*, 218
- miniature landscape, 97
- Mission San Juan Capistrano, garden, 150, 180
- Mission San Luis Rey, garden, 159
- Modelo Shales, 146
- monkey flower. See *Mimulus*
- montbretia. See *Crocasmia ×crocsmiiflora*

- moon stones. See *Pachyphytum*
- Moore, Jeff, Solana Succulents nursery, design, 38, 39, 46, 84, 85, 86, 87, 144, 169, 178, 195, 225
- mosaic, 73, 75
- mother-in-law's tongue. See *Sansevieria*
- mother of thousands. See *Bryophyllum*, *Kalanchoe daigremontiana*
- mulch, 77, 78, 122, 135, 140
- Munster, Phyllis and Bill, garden, 74
- Myoporum*, 213
- Myrtillocactus geometrizans*, 21, 86, 87
- myrtle. See *Myrtus communis*
- Myrtus communis*, 235
- Namibian sea onion. See *Bowiea volubilis*
- Nandina domestica*, 234, 235
- Nassella tenuissima*, 28, 240
- nasturtium. See *Tropaeolum majus*
- Nerium oleander*, 234, 235
- New Zealand flax. See *Phormium*
- New Zealand tea tree. See *Leptospermum scoparium*
- Nolina*. See *Beaucarnea*
- O'Byrne, Marietta and Ernie, Northwest Garden Nursery, design, 131
- ocotillo. See *Fouquieria splendens*
- octopus agave. See *Agave vilmoriniana*
- Oenothera speciosa*, 219
- old man cactus. See *Cephalocereus senilis*
- Olea europaea*, 236
- oleander. See *Nerium oleander*
- olive tree. See *Olea europaea*
- Opuntia*, 64, 76, 78, 81, 125, 155
- Opuntia basilaris*, 78
- Opuntia ficus-indica*, 13, 66, 80
- Opuntia macrocentra*, 53, 78, 81
- Opuntia microdasys*, 78, 80
- Opuntia violacea*. See *O. macrocentra*
- organpipe cactus. See *Stenocereus*
- Orostachys*, 126, 127
- Oscularia deltoides*, 52, 72, 98
- over-wintering, 14, 121, 124
- Pachyphytum*, 201
- Pachypodium*, 161
- ×*Pachyveria*, 53, 201
- palo verde. See *Cercidium*, *Parkinsonia*
- paperbark tree. See *Melaleuca*
- Pardee Homes, Soleil garden, 88, 89
- Parkinsonia*, 31, 79, 80, 198, 228
- Parodia*, 106, 109
- Paul, Phyllis, garden, 152
- Peckerwood Garden, Hempstead, TX, 245
- Pelargonium peltatum*, 40, 166, 220
- Pennisetum setaceum* 'Rubrum', 240, 241
- penwiper plant. See *Kalanchoe marmorata*
- Perovskia* 'Blue Spire', 236
- Petitmermet, Peggy, garden and design, 40, 105, 175, 219
- Phillips, Karen, garden and design, 33
- Phormium*, 25, 220
- Pilosocereus azureus*, 52, 62, 80
- pindo palm. See *Butia capitata*
- Pink, Jolee, garden and design, 84, 86, 87
- Pithecellobium flexicaule*, 80, 236, 237
- Pitzer College desert garden, 75, 155
- Point Loma College garden, 159
- pomegranate. See *Punica granatum*
- ponytail palm. See *Beaucarnea*
- pool plantings, 20, 26, 32, 156, 214
- pork and beans. See *Sedum* ×*rubrotinctum*
- Portulaca grandiflora*, 55, 57, 100, 201
- Portulacaria afra*, 181–182
- Portulacaria afra* 'Variegata', 38, 46, 113, 144, 166, 169, 182
- pride of Madeira. See *Echium candicans*
- propeller plant. See *Crassula falcata*
- Punica granatum*, 236, 237
- purple fountain grass. See *Pennisetum setaceum* 'Rubrum'
- Quail Botanical Gardens, Encinitas, CA, 84, 85, 86, 103, 195, 245
- Queen, Christopher and Jodi, garden, 31, 38

- Rader, Margee, The Original Living Wreath, 113, 115, 117, 184, 205
- Rancho La Puerta, 105, 223, 234, 239, 242
- Rancho Santa Ana Botanical Garden, Claremont, CA, 224, 245
- Rancho Soledad Nursery, 151, 152, 168
- rat-tail cactus. See *Aporocactus flagelliformis*
- red apple iceplant. See *Aptenia cordifolia*
- red valerian. See *Centranthus ruber*
- red yucca. See *Hesperaloe*
- repotting, 110
- Reynolds, Marlene, garden and design, 82
- Rhodiola*, 126, 128
- rock and boulder gardens, 69–70, 71, 130, 186, 190, 192, 197, 203, 204, 219, 231
- rockrose. See *Cistus*
- Roger's Gardens nursery, design, 101
- Romneya coulteri*, 221
- Rosa banksiae*, 243
- rosary vine. See *Ceropegia woodii*
- rosea ice plant. See *Drosanthemum floribundum*
- rosemary. See *Rosmarinus officinalis*
- rose moss. See *Portulaca grandiflora*
- Rosmarinus officinalis*, 42, 45, 213, 238
- Ross, Gloria and Ramon, garden, 26
- Rule, Jeffrey, design, 239
- Russian sage. See *Perovskia* 'Blue Spire'
- Ruth Bancroft Garden, Walnut Creek, CA, 245
- Sackett, David and Phoebe, garden, 39
- sage. See *Salvia*
- sago palm. See *Cycas revoluta*
- Salm, Arthur and Duerksen, Susan, garden and design, 40, 166
- Salvia*, 238
- Samstad, Anne, garden and design, 55, 100, 112
- Sansevieria*, 87, 141, 182–183
- San Francisco Botanical Garden, 245
- Santa Barbara Botanic Garden, 22, 245
- Santa Barbara daisy. See *Erigeron karvinskianus*
- Santolina chamaecyparissus*, 221
- Schaefer, Rob and Suzy, garden and design, 18, 25, 27, 97, 99, 107, 114, 191
- Schaer, Carolyn and Herbert, garden, 16, 36, 58, 168, 172, 187
- Schinus molle*, 42, 238
- Schlumbergera*, 202, 203
- Schnetz, Bill, Schnetz Landscape Inc., design, 28, 152
- sea-themed gardens (succulent seascapes), 84–87, 85–87, 195
- Sedum acre*, 114, 128
- Sedum album*, 69, 128
- Sedum* 'Autumn Joy', 128
- Sedum* 'Garnet Brocade', 182
- Sedum kimmachii*, 113, 202, 203
- Sedum morganianum*, 33, 99, 114, 203
- Sedum nussbaumerianum*, 50, 58, 63, 203, 204
- Sedum* ×*rubrotinctum*, 49, 50, 59, 71, 72, 91, 107, 113, 190, 204, 204
- Sedum rupestre*, 52, 69, 98, 113, 130, 130
- Sedum spathulifolium* 'Cape Blanco', 101
- Sedum spectabile*, 32, 128, 183
- Sedum spurium*, 51, 72, 113, 130
- Sedum telephium*, 130, 183
- Sempervivum*, 51, 130, 131, 204, 205
- Sempervivum arachnoideum*, 113, 130, 131, 193
- Sempervivum tectorum*, 50, 102, 193
- Senecio articulatus*, 206
- Senecio cineraria*, 221
- Senecio haworthii*, 53
- Senecio mandraliscae*, 16, 27, 40, 42, 45, 52, 53, 59, 61, 87, 97, 107, 206
- Senecio rowleyanus*, 87, 100, 113, 184, 205, 206
- Senecio serpens*, 25, 30, 38, 39, 46, 52, 58, 71, 78, 80, 105, 113, 144, 149, 167, 172, 206, 225
- Senecio talinoides*, 31, 166, 183
- Senna*, 238, 239
- Shannon, Keith and Pinkerton, Peter, garden, 59
- Sherman Library and Gardens, Corona del Mar, CA, 100, 153, 245
- silver jade plant. See *Crassula arborescens*
- silver torch. See *Cleistocactus strausii*
- SJA Inc., design, 88, 89, 104, 214
- Smithgall, Denny. See SJA Inc.
- soil requirements, mixes and amendments, 22–23, 37, 77, 87, 111, 116, 122, 140, 156, 172, 210

- Soler, Ivette, garden and design, 99
 Southwest Landscape, design, 26
Sparaxis tricolor, 212
 Speert, Ellen, Center for Creative Renewal, garden and design, 91, 173
Sphaeralcea ambigua, 239
 Spurgin, Jill, garden and design, 44
Stapelia, 82, 207
 statice. See *Limonium perezii*
Stenocereus, 13, 80
 Sternlieb, Shoshanah and Geoff, garden and design, 37
 sticks on fire. See *Euphorbia tirucalli* 'Sticks on Fire'
Stipa tenuissima. See *Nassella tenuissima*
 stonecrop. See *Sedum* entries
 strawberry tree. See *Arbutus unedo*
 streetside gardens, 41–42
Strelitzia reginae, 82, 222
 string of pearls. See *Senecio rowleyanus*
 Sullivan, Chris and Margaret, garden and design, 77
 sunburn, 121, 137
 Sutro, Janet, Sequoia Environmental Enhancements, design, 12, 94

Tagetes lemmonii, 239
 tapestry garden, 43, 72, 142
 Teague, Bill, design, 27, 85, 86, 103, 105, 195
Tecoma capensis, 243
Tecoma stans, 80, 240
 Texas ebony. See *Pithecellobium flexicaule*
 Texas ranger. See *Leucophyllum frutescens*
 Theilacker, Michael, ASLA, design, 64
 topiary, 101, 101, 113–117, 113, 115, 117
 Torre-Bueno, Ava, garden and design, 198
Tradescantia pallida 'Purpurea', 53, 61, 177, 222
Trichocereus, 79
Tropaeolum majus, 210, 211
 Tropic World nursery, 81
 Tucson Botanical Gardens, 245

 Water Conservation Garden, El Cajon, CA, 75, 245
 wax flower. See *Hoya*
 window boxes, 101, 103, 220, 221

 wreath, 43, 53, 101, 113–117, 114
 Wright, Dick, 194

 xeriscape, 11

 yarrow. See *Achillea millefolium*
 yellow bells. See *Tecoma stans*
 Young, Don and Jill, garden, 28, 179, 180, 239
Yucca, 13, 25, 55, 64, 125, 162
Yucca aloifolia, 81, 82, 83
Yucca rostrata, 31
Yucca whipplei, 21, 157

Zamia, 99
Zauschneria californica, 222